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United States
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Beltsville Agricultural
Research Center
Beltsville, Maryland

July 1992

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National Potato Germplasm Evaluation and Enhancement Report, 1991

Sixty-Second Annual Report
by Cooperators

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Agriculture

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Service

Beltsville Agricultural
Research Center
Beltsville, Maryland

June 1992

**National Potato
Germplasm Evaluation
and Enhancement
Report, 1991**

Sixty-Second Annual Report by Cooperators

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UNITED STATES DEPARTMENT OF AGRICULTURE
BELTSVILLE AGRICULTURAL RESEARCH CENTER (BARC),
BELTSVILLE, MARYLAND, AND CHAPMAN, ECHO LAKE,
AND AROOSTOOK FARMS, PRESQUE ISLE, MAINE

K.G. HAYNES, R.W. GOTH, and D.R. WILSON

- Introduction** Objectives: The USDA potato breeding program at Beltsville has four main objectives: (1) to develop improved pest-resistant germplasm lines and varieties; (2) to develop improved germplasm lines and varieties for processing directly out of cold storage; (3) to enhance germplasm for specific characteristics relating to pest resistance, yield, environmental stress, human nutrition and consumer acceptance; and (4) to develop statistical genetic models for some of the new breeding strategies.
- Breeding** BARC: Hybridizations in the greenhouse at BARC in early 1991 were made among tetraploid clonal material possessing resistance to scab, late blight, heat necrosis, and PVS; high quality; processing and fresh market potential; yellow flesh; and adaptability to various ecological test zones. Three hundred and fourteen crosses were successful. Hybridizations among diploid clonal material were made for yield, specific gravity and yellow flesh. Four hundred and sixteen crosses were successful. Interploidy hybrids were made between the tetraploid and diploid populations for yield, specific gravity and yellow flesh. Eighty-two crosses were successful. Approximately 20,600 seedling tubers were produced from 102 parental combinations in the tetraploid population. All seedling tubers were grown on the Chapman Farm.
- Disease Evaluations** Aroostook Farm: Preliminary and advanced trials were conducted on breeding clones and varieties for resistance to scab, early blight, late blight, leafroll, Verticillium and Rhizoctonia. Dr. Simeon Leach of Maine continued to evaluate some of our germplasm for resistance to Fusarium and Rhizoctonia. Dr. Bill Brodie of New York continued to evaluate our germplasm for resistance to the golden nematode.
- Scab: Seventeen advanced selections and four standard varieties were evaluated for the fourth year in one advanced trial. Scab resistance in B0184-30, B0186-3, B0180-31, B0186-1 and B0221-6 continues to look promising. Thirteen advanced breeding lines in the final stages of varietal evaluation were evaluated in a second advanced trial for scab resistance. Of these, B9922-11 and B0175-20 had moderate levels of resistance equal to Russet Burbank. B0178-34 and B0256-1 were as susceptible as Green Mountain. Forty-five selections were evaluated in a preliminary trial. Of these, B0610-2, B0615-2, and B0808-3 were the most resistant. Seventeen diploid selections were tested in a preliminary trial. No scab lesions were found on 7 of these selections; four were as susceptible as Green Mountain.

Verticillium: One thousand three hundred and thirty-two lines and their parents were evaluated for Verticillium wilt and pinkeye in the heritability study.

Early blight: Ninety-two breeding lines and four standard varieties were evaluated in the early blight plot. All breeding lines were more tolerant to early blight than Kennebec.

Late blight: Seventy-eight lines were evaluated in the late blight plot. B0692-4, B0711-1, B0718-3, B0748-1F, B0750-1, B0767-2F, B0801-1, B0807-2, and B0807-3 had a level of resistance greater than or equal to Atzimba. Of these, B0692-4 and B0750-1 were among the better yielding, higher specific gravity lines tested.

Processing
Evaluations

Echo Lake: Round white (Tables 1-6), russet (Tables 7-9) and red-skin (Table 10) yield trials were planted in a randomized complete block design with four replications of 25 hill plots at Echo Lake in May. Plants were spaced at 9 inches within the row in the round whites and reds, and at 12 inches in the russets. At harvest tubers from each plot were graded, specific gravity was determined by the weight in air and weight in water method, and a sample of tubers was cut to determine the presence of hollow heart and internal necrosis. Yields were low due to extreme heat and drought during the growing season. Tuber samples were stored at 40°F, 45°F, and 50°F. Samples were processed out of 40°F, 45°F, 50°F, and following a three week reconditioning period out of 40°F during January and February. For each combination of storage temperature and processing date, 10 tubers per sample from each plot were cooked (40 samples per clone).

Potato chips were made from each round white and red sample by taking 1/16-inch slices from cross and lengthwise sections of each tuber. Lengthwise chips were used to detect possible increase in reducing sugars, particularly near the stem end. Slices were rinsed in water and placed on paper towels to remove excess moisture. Chips were then fried at 340°F in Primex vegetable shortening until bubbling ceased.

The yield, specific gravity, and chip color out of 50°F storage in January of B9792-8B, B9792-158, B0172-22, B0176-24, and B0178-34 continue to compare favorably to the yield, specific gravity and chip color of Atlantic. The yield and specific gravity of B0256-1 and B0257-12 continue to compare favorably to the yield and specific gravity of Atlantic. However, these lines are primarily for chipping from the field. Heat necrosis was a problem this year in B0172-22, B0176-24 and in B0178-34, undoubtedly because of the high temperatures during the growing season. It has not been a problem in these lines prior to this year. Of four new lines with the yield and specific gravity of Atlantic this year (B0554-1, B0585-1, B0682-6, B0717-1) only B0717-1 appears to have cold storage chipping potential.

Russet types were processed into french fries. A 3/8-inch diameter plug was cut from the cross and lengthwise sections of each tuber, washed, dried, and fried at 360°F for five minutes.

B9922-11 continues to show promise as a fresh market russet for the east coast. It has consistently produced larger size tubers than Russet Burbank under our growing conditions. B0220-14 continues to show promise as an early season processing line. For the past two years B0339-1, B0362-2, B0427-7, and B0647-1 have looked good in terms of yield, specific gravity and fry scores. B0339-1 and B0362-2 have processed into February after 45°F storage.

After frying, each potato chip and french fry was classified into color classes. Chip classes ranged from 1 = very light to 10 = very dark. French fry classes ranged from 1 = very light to 5 = very dark. Weighted averages were calculated by multiplying the number of chips or french fries in each color class by the color class, totaling, and dividing by the number of chips or french fries in each sample. Color ratings were made by using the PCII reference color chart 1206-U.

Germplasm Enhancement and Varietal Development Chapman Farm: Of the approximately 20,600 seedling tubers planted, 971 were saved for replanting in 1992 in 12-hill plots. Of the 665 clones evaluated in 12-hill plots, 215 were saved for evaluation in 40-hill plots in 1992. Of the 268 clones evaluated in 40-hill plots, 145 were saved for evaluation in 60-hill plots in 1992. Of the 164 clones evaluated in 60-hill plots, 96 were saved for evaluation in 80-hill plots in 1992. Of the 66 clones evaluated in 80-hill plots, 48 were saved for evaluation in 100-hill plots in 1992. Of the 34 clones evaluated in 100-hill plots, 25 were saved for evaluation in 150-hill plots in 1992. Of the 10 clones evaluated in 150-hill plots, 7 were saved for evaluation in 200-hill plots in 1992. Of the 89 clones evaluated in 200-hill plots, 39 were saved for evaluation in 200-hill plots in 1992. The 234 soft rot clones saved in 1990 were grown in 1991, and will be retested for soft rot resistance during the winter months. The 288 diploid clones saved in 1990 were grown in 1991, and re-evaluated for yield and specific gravity.

All index materials planted on Chapman were done in tuber units with six feet between rows and five feet between units to continue the virus/viroid indexing program.

Seed tubers of promising clones and standard varieties were distributed for adaptability and/or processing trials and/or preliminary evaluation to Maine, New York (Upstate and Long Island), New Jersey, Pennsylvania, Virginia, North Carolina, Florida, Michigan, Ohio, California, and Colorado.

Echo Lake: Twenty-eight clones were planted in a randomized complete block design with three replications of five hills to evaluate their potential for the yellow flesh market. Dr. Stephen Sinden determined the beta-carotene content of some of the more promising lines in this population again this year.

Statistical and Genetic Modelling	The inbreeding coefficient of derived tetraploids for the various breeding strategies utilizing $2n$ gametes was derived (J. Heredity 83:67-70). These derivations revealed that inbreeding will occur in derived tetraploids in most instances and defined the multiple genetic sources of inbreeding. The covariance between haploid-species parent and its tetraploid offspring obtained from $4x-2x$ hybridizations was derived (J. Heredity 83:119-122). This covariance had components due to one, two, three, four and five gene identity by descent measures. Current research is being undertaken on defining conditions that minimize the inbreeding coefficient for derived tetraploids.
Summary	Considerable progress is being made in all four objectives in the USDA potato breeding program. A good chipping potato, B9792-8B, will be released as Sunchip next year. Other promising chipping lines include B0175-20, B0178-34, B0256-1, B0257-12 and B0717-1. Several promising russets for fresh market or early frying are B9922-11, B0220-14, B0339-1 and B0362-2. Crosses between scab, late blight, and heat necrosis resistant lines with processing or fresh market potential are continuing. Genetic studies are in progress on the inheritance of resistance to Verticillium wilt, scab and heat necrosis. Efforts are underway to quantify scab resistance/susceptibility to assist in the interpretation of disease resistance studies. The germplasm base is being expanded through the introduction of diploid germplasm into the breeding effort, particularly for traits such as yellow flesh, scab resistance, and specific gravity. Statistical genetic modelling of interploidy hybridizations is continuing in an effort to facilitate the incorporation and exploitation of this new germplasm into the breeding program.

BARC Table 1. Yield, tuber size distribution, and quality characteristics of round whites harvested 122 days after planting at Echo Lake in 1991.

Pedigree	Mkt		% Tuber Size Distribution					Internal Defects			
	CWT/A	%Mkt	<1½"	1½"-2¼"	2¼"-3½"	3½"-4"	>4"	SG ¹	HH ²	HN ³	No. cut tubers
Atlantic	212	91	7.9	27.5	57.2	6.7	0.1	82	0	6	15
B9792-158	259	90	9.0	31.8	48.7	9.7	0.1	81	1	1	20
B9792-8B	281	93	5.7	39.2	49.3	4.5	1.3	85	1	0	20
B9988-7	213	91	8.7	32.4	54.1	4.8	0	73	0	0	10
B0172-15	232	96	3.9	19.9	63.5	12.7	0	73	2	0	20
B0172-22	252	94	5.6	27.4	57.1	9.8	0	83	1	9	20
B0174-11	167	91	9.2	30.9	54.7	5.1	0	87	0	0	18
B0174-16	158	86	14.4	47.2	36.0	2.4	0	89	1	3	10
B0174-19	190	88	11.6	32.4	54.8	1.2	0	81	2	6	15
B0175-20	182	92	7.9	26.2	52.2	13.7	0	84	3	12	15
B0175-21	157	94	6.3	45.8	45.1	2.8	0	90	0	0	15
B0176-24	231	90	9.8	37.1	48.1	5.0	0	84	0	5	20
B0177-20	172	86	14.4	44.0	40.2	1.4	0	90	0	0	7
B0178-14	132	69	31.4	56.2	12.4	0.0	0	93	-	-	-
B0178-16	151	80	20.0	52.7	25.7	1.5	0	91	0	0	6
B0178-30	184	89	10.6	42.7	45.2	1.5	0	87	0	4	17
Monona	166	90	9.9	38.6	47.5	4.0	0	70	0	0	10
Norchip	106	67	33.0	53.2	12.5	1.2	0	78	0	0	2
LSD (.05)	50							04			

¹ 1.0 omitted

² Number of tubers with hollow heart

³ Number of tubers with internal necrosis

BARC Table 1 (continued)

Temperature		50°F		45°F		40°F		40°-70°F		50°F		45°F		40°F		40°-70°F	
Date		1/3		1/16		1/14		1/21		2/3		2/6		2/7		2/24	
Pedigree	Chip ⁴	Spt ⁵	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	
Atlantic	7.8	S	9.0	S	9.3	O	7.8	S	8.5	M	8.6	S	9.6	S	8.1	L	
B9792-158	7.3	L	7.5	M	8.2	S	7.9	M	8.1	VL	8.4	VL	8.6	M	8.0	M	
B9792-8B	7.3	M	7.6	S	8.4	S	7.6	S	8.1	M	8.4	M	8.8	S	8.5	S	
B9988-7	7.9	M	8.7	M	10.0	S	8.7	S	8.7	L	9.1	L	10.0	S	9.3	M	
B0172-15	7.2	S	7.9	S	9.3	S	8.1	S	8.2	M	8.1	S	9.6	S	8.7	S	
B0172-22	7.1	M	7.7	S	8.8	S	7.5	S	7.7	M	8.5	M	9.3	S	8.3	S	
B0174-11	7.3	M	7.6	S	8.6	O	7.5	S	8.0	L	8.6	M	8.7	S	7.5	S	
B0174-16	7.7	M	7.9	M	9.0	O	8.0	S	8.0	L	8.3	M	8.6	S	8.6	M	
B0174-19	8.1	S	9.1	S	9.7	O	9.2	S	8.5	M	9.6	M	10.0	S	9.7	S	
B0175-20	7.3	S	7.6	S	7.9	S	7.6	S	8.2	M	8.7	S	8.7	S	8.3	S	
B0175-21	7.4	S	7.8	S	8.8	S	7.7	S	8.0	VL	7.9	S	9.0	S	7.9	S	
B0176-24	7.6	S	8.6	S	8.4	O	8.2	S	8.4	L	9.0	M	9.1	S	8.5	S	
B0177-20	7.4	S	7.7	S	9.1	O	7.6	S	8.1	L	8.8	M	9.5	S	8.1	S	
B0178-14	7.6	M	8.3	M	9.1	S	8.0	S	8.7	VL	9.8	L	9.9	S	8.9	S	
B0178-16	7.5	M	7.5	S	8.0	S	7.6	S	8.2	M	8.4	M	8.3	S	8.6	S	
B0178-30	7.3	VL	8.1	M	8.9	S	8.1	L	8.1	VL	8.6	VL	9.8	M	9.0	L	
Monona	6.9	S	7.1	S	8.6	O	7.2	S	7.6	M	7.9	M	7.9	S	7.7	S	
Norchip	7.6	S	7.3	S	8.6	O	7.7	S	8.1	M	8.5	M	9.1	S	8.5	S	

4 Chips: 1-7 = Satisfactory

5 Sprout length: O = no sprouts

S = <0.5"

M = 0.5 - 1.5"

L = 1.5 - 2.5"

VL = >2.5"

BARC Table 2. Yield, tuber size distribution, and quality characteristics of round whites harvested 122 days after planting at Echo Lake in 1991.

Pedigree	Mkt CWT/A	%Mkt	% Tuber Size Distribution					>4"	SG ¹	Internal Defects		
			<1 1/4"	1 1/4"-2 1/4"	2 1/4"-3 1/4"	3 1/4"-4"				HH ²	HN ³	No. cut tubers
Atlantic	245	93	7.3	30.1	56.2	6.5	0	82	2	3		17
B0178-34	218	88	12.3	47.9	39.3	0.1	0	82	0	2		5
B0178-35	215	83	17.0	51.9	31.1	0.0	0	86	0	0		10
B0179-17	270	94	5.8	28.6	54.9	10.8	0	83	1	1		20
B0179-18	183	92	5.6	21.9	59.1	10.8	2.6	76	2	1		18
B0179-6	107	62	37.6	54.7	7.7	0.0	0	88	-	-		--
B0180-24	174	76	24.4	46.0	29.0	0.6	0	76	1	0		5
B0183-25	278	93	7.2	43.2	44.2	5.4	0	75	0	1		10
B0184-18	198	87	13.4	37.3	46.1	3.2	0	73	0	0		10
B0202-4	245	89	11.0	43.9	43.3	1.8	0	72	0	0		15
B0203-21	186	91	9.4	36.7	50.5	3.4	0	73	0	0		15
B0209-1	220	95	3.9	13.9	65.9	15.4	0.8	69	1	0		20
B0233-1	164	88	12.2	48.4	37.8	1.6	0	67	0	0		11
B0234-8	213	91	7.2	30.1	53.2	7.6	2.0	84	1	4		20
B0237-9	159	80	20.3	56.1	22.2	1.4	0	74	0	0		5
B0240-11	230	89	10.6	37.7	47.9	3.8	0	76	3	2		15
Kennebec	226	95	5.1	30.0	52.4	12.6	0	68	2	0		20
Superior	196	94	6.3	37.2	52.1	4.4	0	79	0	0		17
LSD (.05)	50							04				

^{1, 2, 3} See Table 1

BARC Table 2 (continued)

Temperature		50°F	45°F	40°F	40°-70°F	50°F	45°F	40°F	40°-70°F
Date		1/6	1/16	1/14	1/21	2/3	2/6	2/10	2/24
Pedigree	Chip ⁴ Spt ⁵	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt
Atlantic	7.9 M	8.3 S	8.3 S	9.2 O	7.6 S	8.4 M	8.8 M	9.7 S	8.6 M
B0178-34	6.9 L	7.6 S	7.6 S	8.2 O	7.6 S	7.9 VL	8.0 L	8.4 S	8.1 S
B0178-35	7.4 L	8.1 L	8.1 L	8.9 S	7.9 M	8.7 VL	8.5 VL	9.4 M	9.2 L
B0179-17	7.3 M	7.8 S	7.8 S	8.8 O	8.2 S	8.0 M	8.1 S	9.2 S	8.7 M
B0179-18	7.5 L	8.1 M	8.1 M	9.2 S	8.2 M	7.9 VL	8.4 VL	8.7 S	8.5 M
B0179-6	7.6 VL	8.0 VL	8.0 VL	8.0 S	7.8 M	8.6 VL	8.4 VL	9.1 L	8.5 L
B0180-24	7.7 VL	8.6 L	8.6 L	9.6 S	8.5 M	9.1 VL	9.1 VL	9.9 M	9.2 L
B0183-25	8.3 M	9.0 S	9.0 S	9.7 O	9.5 S	9.6 L	9.7 M	10.0 S	10.0 S
B0184-18	7.9 S	8.2 S	8.2 S	9.5 O	8.4 S	9.0 L	8.6 S	9.0 O	9.3 M
B0202-4	7.5 S	8.4 M	8.4 M	9.5 S	7.9 S	8.9 M	8.9 M	9.7 S	9.2 M
B0203-21	7.4 M	8.1 S	8.1 S	9.8 O	7.7 S	8.7 L	8.3 M	9.8 S	8.8 M
B0209-1	7.3 M	8.0 S	8.0 S	9.2 O	8.1 S	7.6 M	8.2 S	9.5 M	8.7 S
B0233-1	8.0 L	8.8 S	8.8 S	9.9 O	8.1 S	8.3 L	8.5 L	9.3 O	8.4 M
B0234-8	7.5 S	7.9 O	7.9 O	8.6 O	7.6 S	8.2 L	8.1 S	8.6 O	8.4 M
B0237-9	7.1 L	7.5 S	7.5 S	8.9 O	7.7 M	7.3 VL	7.8 M	9.4 S	8.4 L
B0240-11	7.5 S	7.6 S	7.6 S	8.2 O	7.7 S	7.9 M	8.1 S	8.2 S	8.2 M
Kennebec	7.8 S	8.4 O	8.4 O	9.2 O	8.1 S	8.6 M	8.9 S	9.5 S	8.3 S
Superior	8.1 M	8.3 S	8.3 S	9.7 O	8.7 S	8.7 VL	8.5 M	9.9 S	9.0 M

4 Chips: 1-7 = Satisfactory

5 Sprout length: O = no sprouts

S = <0.5"

M = 0.5 - 1.5"

L = 1.5 - 2.5"

VL = >2.5"

BARC Table 3. Yield, tuber size distribution, and quality characteristics of round whites harvested 122 days after planting at Echo Lake in 1991.

Pedigree	Mkt		% Tuber Size Distribution					Internal Defects			
	CWT/A	%Mkt	<1 1/8"	1 1/8"-2 1/4"	2 1/4"-3 1/4"	3 1/4"-4"	>4"	SG ¹	HH ²	HN ³	No. cut tubers
Atlantic	251	94	4.9	24.2	60.7	9.2	0.9	83	1	0	20
B0241-8	238	95	5.5	28.2	54.2	12.1	0	73	0	1	20
B0243-10	241	97	2.5	20.6	65.3	11.6	0	78	2	0	20
B0243-18	226	93	7.1	27.1	59.7	6.1	0	76	0	0	19
B0243-20	155	90	9.8	46.2	43.3	0.7	0	80	0	0	7
B0243-7	184	89	11.4	49.5	39.1	0.0	0	79	0	0	13
B0245-15	164	97	3.0	13.1	60.2	23.8	0	80	3	0	20
B0246-6	198	92	8.4	25.2	62.6	3.8	0	77	0	0	20
B0255-9	159	89	11.1	51.1	37.8	0.0	0	87	0	0	7
B0256-1	210	91	9.4	47.4	42.0	1.2	0	86	0	0	12
B0257-12	221	90	10.0	42.0	45.6	2.4	0	81	0	0	14
B0257-3	157	85	15.1	55.2	29.0	0.6	0	87	0	0	7
B0257-9	146	92	4.2	24.9	57.6	9.9	3.4	86	0	0	20
B0386-9	147	75	25.3	59.6	15.1	0.0	0	76	0	0	2
B0405-4	155	73	27.0	55.9	17.1	0.0	0	80	-	-	--
B0405-6	149	69	30.9	61.1	7.9	0.0	0	76	-	-	--
Coastal Chip	207	88	12.1	37.3	49.3	1.3	0	80	0	0	20
Superior	194	94	5.8	32.5	56.1	5.6	0	76	0	0	20
LSD (.05)	33							04			

^{1, 2, 3} See Table 1

BARC Table 3 (continued)

Temperature		50°F		45°F		40°F		40°-70°F		45°F		40°F		40°-70°F	
Date		1/6	Chip ⁴ Spt ⁵	1/16	Chip Spt	1/14	Chip Spt	1/21	Chip Spt	2/3	Chip Spt	2/10	Chip Spt	2/24	Chip Spt
Atlantic		8.1	M	8.9	M	9.5	S	8.2	M	9.2	L	8.9	M	9.7	S
B0241-8		7.8	M	7.8	S	9.0	O	7.3	S	8.7	M	8.9	S	9.5	S
B0243-10		7.6	M	7.6	S	8.3	O	7.8	S	8.7	M	8.3	M	8.6	O
B0243-18		7.3	L	7.3	M	7.6	S	7.1	M	8.4	VL	8.1	M	7.7	S
B0243-20		7.7	L	7.7	L	9.2	S	7.7	M	8.6	VL	8.7	VL	9.2	M
B0243-7		7.5	L	7.3	M	8.6	S	7.6	M	8.4	L	8.7	VL	9.3	S
B0245-15		7.7	O	7.6	O	7.6	O	7.8	S	8.2	O	8.0	O	7.9	S
B0246-6		7.9	VL	8.3	L	8.8	S	7.8	M	7.9	VL	8.5	VL	9.6	M
B0255-9		7.8	M	8.1	S	9.2	S	7.7	S	7.9	M	8.6	M	9.4	S
B0256-1		8.5	M	9.3	M	9.7	S	8.9	M	9.1	L	10.0	M	9.9	S
B0257-12		8.4	L	8.5	M	9.1	S	8.3	M	8.5	VL	8.5	L	9.3	S
B0257-3		7.8	M	7.9	S	8.3	S	7.7	M	8.2	VL	7.8	M	8.7	S
B0257-9		7.7	L	8.0	M	8.6	S	7.8	M	8.0	VL	8.7	L	7.9	S
B0386-9		8.5	VL	9.0	VL	9.9	M	8.9	L	9.7	VL	8.9	VL	9.9	L
B0405-4		7.9	M	8.1	M	8.3	S	8.5	M	8.6	L	8.9	L	8.5	S
B0405-6		8.4	L	8.6	L	9.2	L	8.9	L	9.2	M	9.1	VL	9.7	L
Coastal Chip		7.6	L	7.5	M	8.1	S	7.6	M	8.4	VL	8.4	VL	8.6	S
Superior		8.4	L	8.9	S	9.7	O	8.7	S	8.7	VL	9.3	M	9.9	S

4 Chips: 1-7 = Satisfactory

5 Sprout length: O = no sprouts

S = <0.5"

M = 0.5 - 1.5"

L = 1.5 - 2.5"

VL = >2.5"

BARC Table 4. Yield, tuber size distribution, and quality characteristics of round whites harvested 122 days after planting at Echo Lake in 1991.

Pedigree	Mkt		% Tuber Size Distribution					Internal Defects			
	CWT/A	%Mkt	<1 1/8"	1 1/8"-2 1/4"	2 1/4"-3 1/4"	3 1/4"-4"	>4"	SG ¹	HH ²	HN ³	No. cut tubers
Atlantic	264	93	7.0	30.5	55.0	7.6	0	85	0	0	20
B0468-20	243	86	13.7	52.9	32.2	1.2	0	74	0	0	20
B0473-6	181	85	15.0	55.2	29.9	0.0	0	91	-	-	--
B0554-1	240	86	14.3	43.6	38.3	3.9	0	82	0	0	15
B0564-12	78	59	40.7	51.2	8.2	0.0	0	85	-	-	--
B0564-6	213	86	13.9	33.2	50.2	2.8	0	78	0	0	16
B0564-8	216	83	16.8	53.2	29.5	0.6	0	84	0	0	4
B0564-9	232	90	8.7	31.8	53.0	5.4	1.1	83	2	0	18
B0566-5	220	90	10.4	37.7	51.9	0.0	0	82	0	0	10
B0582-1	217	92	8.3	31.2	56.8	3.7	0	84	0	0	20
B0583-2	213	73	27.2	49.6	22.1	1.0	0	86	0	0	7
B0583-8	129	75	24.7	61.7	13.5	0.0	0	89	-	-	--
B0585-1	258	92	7.8	34.7	55.3	2.1	0	81	0	0	20
B0585-5	238	96	4.5	20.6	64.1	10.8	0	79	0	1	20
B0585-6	187	93	7.0	39.3	52.2	1.4	0	74	0	0	6
B0586-3	185	91	8.5	43.5	48.0	0.0	0	87	-	-	--
Monona	194	95	4.8	33.0	55.8	6.4	0	69	0	0	15
Norchip	163	75	25.1	60.6	13.6	0.6	0	80	0	0	1
LSD (.05)	31							03			

^{1,2,3} See Table 1

BARC Table 4 (continued)

Temperature		50°F		45°F		40°F		50°F		45°F		40°F		40°-70°F	
Date		1/7		1/16		1/15		2/4		2/6		2/10		2/24	
Pedigree	Chip ⁴ Spt ⁵	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt
Atlantic	8.2 M	8.8 S	8.4 S	8.3 S	8.3 S	8.9 VL	9.4 M	8.9 VL	9.4 M	8.9 VL	9.4 M	8.9 VL	9.4 M	8.9 VL	9.4 M
B0468-20	10.0 M	10.0 M	10.0 S	10.0 S	10.0 S	10.0 L	10.0 M	10.0 L	10.0 M	10.0 M	10.0 M	10.0 S	10.0 S	10.0 S	10.0 S
B0473-6	8.9 L	9.6 M	9.9 S	9.9 S	9.9 S	8.7 VL	9.3 VL	8.7 VL	9.3 VL	9.3 VL	9.3 VL	9.9 S	9.9 S	9.5 M	9.5 M
B0554-1	9.2 VL	9.9 VL	10.0 L	10.0 L	10.0 L	9.9 VL	9.8 VL	9.9 VL	9.8 VL	9.8 VL	9.8 VL	10.0 L	10.0 L	10.0 VL	10.0 VL
B0564-12	7.2 L	7.8 M	8.4 S	8.4 S	8.4 S	8.1 VL	8.1 VL	8.1 VL	8.1 L	8.1 L	8.1 L	8.3 S	8.3 S	8.6 L	8.6 L
B0564-6	7.4 M	7.7 M	8.2 S	8.2 S	8.2 S	8.9 L	8.4 M	8.9 L	8.4 M	8.4 M	8.4 M	8.4 S	8.4 S	8.6 L	8.6 L
B0564-8	7.5 VL	7.9 M	8.3 S	8.3 S	8.3 S	8.6 VL	8.5 VL	8.6 VL	8.5 VL	8.5 VL	8.5 VL	8.7 S	8.7 S	9.0 VL	9.0 VL
B0564-9	8.9 M	9.2 S	9.6 S	9.6 S	9.6 S	9.6 VL	8.6 VL	9.6 VL	8.6 L	8.6 L	8.6 L	9.5 S	9.5 S	9.4 L	9.4 L
B0566-5	8.0 L	8.5 L	9.2 S	9.2 S	9.2 S	9.0 VL	9.5 VL	9.0 VL	9.5 VL	9.5 VL	9.5 VL	9.9 M	9.9 M	9.3 VL	9.3 VL
B0582-1	7.3 VL	7.4 VL	7.8 M	7.8 M	7.8 M	7.9 L	8.4 VL	7.9 VL	8.4 VL	8.4 VL	8.4 VL	8.2 M	8.2 M	8.7 VL	8.7 VL
B0583-2	8.2 L	9.2 VL	9.9 M	9.9 M	9.9 M	8.6 L	9.5 L	9.1 VL	9.5 L	9.5 L	9.5 L	10.0 M	10.0 M	9.6 M	9.6 M
B0583-8	7.7 M	8.3 S	8.6 O	8.6 O	8.6 O	7.4 S	8.6 M	8.5 L	8.6 M	8.6 M	8.6 M	9.3 S	9.3 S	8.3 S	8.3 S
B0585-1	8.2 VL	8.7 VL	9.6 M	9.6 M	9.6 M	8.6 L	9.5 VL	9.1 VL	9.5 VL	9.5 VL	9.5 VL	10.0 L	10.0 L	9.7 VL	9.7 VL
B0585-5	7.4 M	8.1 S	8.3 O	8.3 O	8.3 O	7.6 S	8.3 M	8.6 VL	8.3 M	8.3 M	8.3 M	8.5 S	8.5 S	8.4 S	8.4 S
B0585-6	8.2 L	8.6 M	9.3 S	9.3 S	9.3 S	8.0 M	8.9 L	8.8 VL	8.9 L	8.9 L	8.9 L	9.2 S	9.2 S	8.6 M	8.6 M
B0586-3	7.7 S	8.7 S	9.2 O	9.2 O	9.2 O	7.5 M	9.7 M	8.7 L	9.7 M	9.7 M	9.7 M	9.5 S	9.5 S	7.9 M	7.9 M
Monona	7.2 M	7.6 M	8.0 S	8.0 S	8.0 S	7.3 M	7.6 L	7.9 L	7.6 L	7.6 L	7.6 L	8.3 S	8.3 S	8.2 M	8.2 M
Norchip	7.6 M	7.9 M	8.3 S	8.3 S	8.3 S	7.9 S	8.6 M	8.5 L	8.6 M	8.6 M	8.6 M	9.3 S	9.3 S	8.4 M	8.4 M

4 Chips: 1-7 = Satisfactory

5 Sprout length: O = no sprouts

S = <0.5"

M = 0.5 - 1.5"

L = 1.5 - 2.5"

VL = >2.5"

BARC Table 5. Yield, tuber size distribution, and quality characteristics of round whites harvested 122 days after planting at Echo Lake in 1991.

Pedigree	Mkt CWT/A	%Mkt	% Tuber Size Distribution					Internal Defects			
			<1 1/4"	1 1/4"-2 1/4"	2 1/4"-3 1/4"	3 1/4"-4"	>4"	SG ¹	HH ²	HN ³	No. cut tubers
Atlantic	169	92	8.4	36.0	53.7	1.9	0	80	1	0	12
B0587-1	171	90	10.4	32.6	54.2	2.8	0	79	0	0	17
B0587-6	215	94	5.7	38.7	51.5	4.1	0	76	4	0	17
B0587-9	123	87	13.3	53.7	32.2	0.8	0	79	0	0	2
B0588-2	137	87	12.9	50.7	34.6	1.9	0	86	1	0	4
B0591-5	161	76	23.9	54.0	22.0	0.0	0	70	0	0	8
B0596-9	189	81	19.2	49.6	28.9	2.3	0	76	0	0	7
B0602-1	140	77	23.1	50.1	26.9	0.0	0	75	0	0	2
B0608-1	78	73	26.8	67.4	5.8	0.0	0	85	-	-	--
B0608-5	149	88	12.3	45.3	40.1	2.3	0	68	0	0	8
B0610-2	146	77	23.3	59.5	17.2	0.0	0	75	-	-	--
B0613-2	195	90	9.5	39.6	48.3	2.7	0	72	0	0	15
B0613-3	104	83	16.7	49.0	32.5	1.9	0	78	0	0	4
B0622-2	106	76	23.8	46.4	28.8	1.1	0	74	0	0	5
B0635-6	140	81	19.0	49.9	30.2	0.9	0	81	2	0	7
B0674-9	100	69	30.7	48.3	21.0	0.0	0	72	-	-	--
Kennebec	126	88	11.5	37.5	43.9	7.1	0	61	0	0	16
Monona	108	85	15.2	47.0	37.7	0.0	0	63	0	0	3
LSD (.05)	43							05			

^{1, 2, 3} See Table 1

BARC Table 5 (continued)

Temperature Date	50°F 1/7	45°F 1/16	40°F 1/15	40°-70°F 1/22	50°F 2/4	45°F 2/7	40°F 2/10	40°-70°F 2/24
Pedigree	Chip ⁴ Spt ⁵	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt
Atlantic	8.5 M	8.5 S	9.1 O	8.0 S	9.4 M	8.9 S	9.6 S	8.8 M
B0587-1	8.2 M	8.9 S	9.5 O	8.5 S	9.5 L	9.0 M	9.9 S	9.6 M
B0587-6	8.8 M	9.3 M	10.0 S	8.7 S	9.6 VL	9.6 L	10.0 S	9.5 M
B0587-9	8.2 VL	9.1 L	9.6 S	8.4 L	8.8 VL	9.0 L	9.8 S	9.0 VL
B0588-2	8.0 L	8.2 M	9.2 S	8.1 M	8.3 VL	8.4 L	9.5 S	9.0 M
B0591-5	9.3 L	9.2 M	9.7 S	8.7 M	9.7 VL	9.9 M	10.0 S	9.4 L
B0596-9	9.2 L	9.4 VL	9.6 M	9.6 M	9.4 VL	9.4 VL	9.7 S	9.6 VL
B0602-1	9.9 VL	10.0 VL	10.0 M	10.0 M	9.8 VL	9.8 VL	10.0 S	9.6 L
B0608-1	8.7 L	8.8 M	9.5 S	9.1 M	9.2 L	9.5 M	10.0 S	9.5 M
B0608-5	7.6 VL	8.0 L	8.7 S	8.6 M	8.5 VL	8.3 VL	9.4 M	9.2 L
B0610-2	7.8 VL	8.7 M	9.3 S	8.2 M	9.0 VL	8.7 L	9.4 S	9.5 VL
B0613-2	8.3 VL	8.7 VL	8.8 L	9.2 L	8.6 VL	8.7 VL	9.0 L	9.2 VL
B0613-3	7.9 L	8.7 M	8.9 S	8.0 M	9.0 VL	8.8 VL	9.5 S	8.9 L
B0622-2	8.5 M	8.9 S	9.0 S	8.7 S	8.7 M	9.0 M	9.7 S	9.3 S
B0635-6	7.3 VL	7.9 VL	8.9 M	7.8 VL	8.9 VL	9.4 VL	8.9 L	9.1 VL
B0674-9	7.4 VL	7.8 VL	8.8 M	7.6 VL	9.1 VL	8.6 VL	9.1 M	8.8 VL
Kennebec	8.2 S	8.6 O	8.9 O	8.3 S	9.0 S	9.0 S	9.4 O	9.0 S
Monona	7.0 M	7.7 M	8.1 O	7.1 S	7.6 VL	7.5 M	8.0 S	8.1 S

4 Chips: 1-7 = Satisfactory

5 Sprout length: O = no sprouts

S = <0.5"

M = 0.5 - 1.5"

L = 1.5 - 2.5"

VL = >2.5"

BARC Table 6. Yield, tuber size distribution, and quality characteristics of round whites harvested 122 days after planting at Echo Lake in 1991.

Pedigree	Mkt CWT/A	%Mkt	% Tuber Size Distribution					SG ¹	Internal Defects	
			<1 1/8"	1 1/8"-2 1/4"	2 1/4"-3 1/4"	3 1/4"-4"	>4"		HH ²	HN ³ No. cut tubers
Atlantic	220	92	6.6	31.3	55.9	5.0	1.1	83	1	2
B0675-4	169	93	7.2	45.5	46.2	1.1	0	83	1	0
B0676-7	299	97	2.3	17.0	63.7	15.8	1.3	69	0	0
B0682-2	167	86	13.8	40.1	45.4	0.7	0	87	0	0
B0682-6	243	96	4.1	22.6	60.5	12.8	0	75	0	0
B0684-1	148	92	7.7	41.4	47.5	3.4	0	79	0	0
B0684-2	157	89	11.5	46.7	37.7	4.2	0	73	0	0
B0684-5	215	96	3.7	22.7	60.3	13.3	0	75	0	0
B0687-14	206	86	14.0	47.2	38.3	0.5	0	81	0	0
B0696-19	136	83	17.1	49.0	33.9	0.0	0	80	-	-
B0696-2	126	86	13.9	44.2	40.8	1.1	0	71	0	0
B0717-1	237	88	12.2	48.4	36.7	2.6	0	79	0	0
B0717-8	171	94	6.2	40.3	53.6	0.0	0	77	0	0
B0720-1	141	90	10.5	44.0	44.2	1.4	0	75	0	0
B0720-4	128	82	17.8	55.1	27.1	0.0	0	74	-	-
B0721-3	120	85	15.3	54.2	30.5	0.0	0	78	0	0
Coastal Chip	200	93	7.0	31.1	59.4	2.4	0	81	0	0
Superior	170	95	5.0	31.2	54.5	9.3	0	76	0	0
LSD (.05)	23							04		

^{1, 2, 3} See Table 1

BARC Table 6 (continued)

Temperature		50°F	45°F	40°F	40°-70°F	50°F	45°F	40°F	40°-70°F
Date		1/8	1/21	1/15	1/22	2/4	2/7	2/10	2/25
Pedigree	Chip ⁴ Spt ⁵	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt
Atlantic	8.0 M	8.8 S	8.0 M	9.8 O	8.4 S	8.5 L	9.1 S	9.7 S	8.6 M
B0675-4	7.6 L	8.0 M	8.0 M	8.9 S	8.1 M	8.4 VL	8.4 L	9.4 M	9.0 VL
B0676-7	7.4 O	7.9 O	7.9 O	9.4 O	8.0 S	8.0 M	8.8 O	9.8 O	9.4 M
B0682-2	7.5 M	7.8 M	7.8 M	8.4 S	7.7 S	8.2 L	7.8 M	9.2 S	8.8 S
B0682-6	8.0 S	9.1 S	9.1 S	9.1 O	8.4 S	8.5 L	8.8 S	9.9 S	9.4 M
B0684-1	7.0 S	7.7 S	7.7 S	8.1 S	7.5 S	8.1 M	7.7 S	8.7 O	9.0 S
B0684-2	6.9 VL	7.6 VL	7.6 L	7.9 S	7.6 VL	8.3 VL	7.5 VL	8.5 M	8.3 VL
B0684-5	7.6 VL	8.5 VL	8.5 VL	9.0 M	7.8 L	8.3 VL	8.3 VL	9.4 L	8.8 M
B0687-14	7.3 VL	7.6 M	7.6 M	8.8 S	7.5 M	8.2 VL	8.7 L	9.2 S	8.5 VL
B0696-19	7.7 L	8.3 S	8.3 S	9.3 S	7.8 L	8.5 VL	8.9 L	9.7 S	8.9 L
B0696-2	8.1 M	9.2 S	9.2 S	9.8 O	8.2 M	8.6 L	9.4 S	10.0 S	9.2 M
B0717-1	7.3 L	8.3 VL	8.3 VL	8.8 M	7.9 L	8.8 VL	8.6 VL	9.7 M	9.5 VL
B0717-8	7.2 L	7.7 S	7.7 S	7.5 O	7.0 M	8.1 VL	7.6 M	8.6 S	8.0 M
B0720-1	8.2 M	8.8 M	8.8 M	9.5 S	8.1 M	8.3 L	8.3 M	9.2 S	9.1 M
B0720-4	7.2 M	8.2 M	8.2 M	8.8 S	7.5 M	8.3 L	8.1 VL	9.2 M	9.1 M
B0721-3	7.1 M	7.5 M	7.5 M	7.9 S	7.5 S	8.2 VL	8.0 M	8.4 S	8.6 M
Coastal Chip	7.1 VL	7.5 M	7.5 M	7.7 S	7.0 M	8.5 VL	7.7 L	8.4 S	8.7 L
Superior	8.1 L	9.0 M	9.0 M	9.7 O	8.6 S	9.0 VL	9.3 M	9.9 O	9.1 M

4 Chips: 1-7 = Satisfactory

5 Sprout length: O = no sprouts

S = <0.5"

M = 0.5 - 1.5"

L = 1.5 - 2.5"

VL = >2.5"

BARC Table 7. Yield, tuber size distribution, and quality characteristics of russets harvested 122 days after planting at Echo Lake in 1991.

Pedigree	Mkt CWT/A	%Mkt	% Tuber Size Distribution				SG ¹	Internal Defects		
			<2 oz	2-6 oz	6-10 oz	10-16 oz	>16 oz	HH ²	HN ³	No. Cut tubers
B9922-11	233	87	3.0	17.6	52.4	16.7	10.4	85	1	0
BelRus	161	86	12.7	54.9	27.8	3.0	1.6	78	0	0
B0045-6	203	88	10.5	39.4	45.7	3.2	1.3	85	2	0
B0169-56	227	86	13.7	50.2	34.0	2.0	0.0	90	0	0
B0180-39	174	88	6.6	33.1	47.3	7.7	5.4	72	0	1
B0184-30	277	89	6.1	32.9	42.1	14.4	4.6	90	11	1
B0186-1	246	95	2.9	19.6	60.1	15.8	1.7	82	1	0
B0186-3	103	68	32.3	61.2	6.5	0.0	0.0	92	-	-
B0190-9	276	91	5.0	22.0	53.9	15.1	4.0	84	0	0
B0220-14	195	94	4.8	25.6	53.2	15.6	0.8	81	0	1
B0221-6	138	81	19.0	62.4	18.0	0.6	0.0	90	0	0
B0306-6	196	89	8.2	44.3	40.1	4.6	2.8	84	0	0
B0310-11	173	86	10.5	40.7	39.5	5.5	3.8	80	0	0
B0311-2	245	87	7.7	25.7	53.3	8.1	5.2	88	0	0
B0315-17	255	92	8.5	33.5	49.5	8.5	0.0	79	0	0
B0316-19	225	87	4.3	25.7	55.2	6.4	8.3	84	0	0
Coastal Russet	218	90	9.3	43.8	40.7	5.6	0.6	76	0	0
Russet Burbank	205	81	18.6	45.3	28.9	7.3	0.0	75	0	1
LSD (.05)	37							05		

^{1, 2, 3} See Table 1

BARC Table 7 (continued)

Temperature	50°F	45°F	40°F	40°-70°F	50°F	45°F	40°F	40°-70°F
Date	1/13	1/23	1/24	1/22	2/4	2/5	2/11	2/25
Pedigree	Fry ⁴ Spt ⁵	Fry Spt	Fry Spt	Fry Spt	Fry Spt	Fry Spt	Fry Spt	Fry Spt
B9922-11	3.1 M	3.3 S	4.5 S	2.8 S	4.0 M	4.4 M	4.9 S	3.0 M
BelRus	3.1 M	3.5 S	4.8 S	4.1 S	3.0 L	3.7 S	5.0 S	4.0 M
B0045-6	-	-	-	-	-	-	-	-
B0169-56	3.3 L	4.1 M	4.5 S	4.1 M	4.3 VL	4.3 L	4.5 S	4.5 VL
B0180-39	2.9 L	3.2 M	3.9 S	2.9 S	3.0 VL	3.0 L	3.8 S	3.4 M
B0184-30	3.5 L	3.9 S	4.3 S	3.4 M	4.0 VL	4.2 L	4.6 S	3.8 L
B0186-1	2.7 M	3.0 L	3.8 S	3.0 M	2.7 VL	3.0 L	4.1 S	3.6 L
B0186-3	2.2 M	2.3 S	3.2 S	2.5 S	2.4 M	2.5 M	3.8 S	2.6 M
B0190-9	3.6 S	4.5 S	4.6 S	3.4 S	3.8 L	4.6 S	4.8 S	3.6 M
B0220-14	2.4 M	2.9 S	3.6 S	2.5 M	2.3 L	2.7 M	3.3 S	2.7 M
B0221-6	3.8 M	4.5 S	4.5 S	3.9 S	3.9 VL	4.0 M	5.0 S	4.3 M
B0306-6	3.4 M	3.6 S	4.3 S	3.7 M	3.6 VL	3.8 M	4.3 S	4.3 M
B0310-11	2.3 L	2.6 M	3.0 S	2.7 S	2.5 VL	2.7 L	3.8 S	2.9 M
B0311-2	3.6 M	3.8 S	4.3 S	3.6 S	3.3 L	4.0 S	4.1 S	3.2 M
B0315-17	2.4 M	2.6 S	3.7 S	2.5 S	2.7 L	3.5 M	4.4 S	3.4 M
B0316-19	4.3 O	4.7 O	5.0 S	4.9 S	4.6 S	4.6 O	5.0 O	4.9 S
Coastal Russet	4.9 M	4.8 S	5.0 S	4.6 M	4.8 VL	4.4 S	5.0 S	4.9 L
Russet Burbank	4.1 O	4.8 O	4.6 O	4.0 S	4.4 S	4.6 S	5.0 O	4.3 S

4 Fry: 1-3 = Satisfactory

5 Sprout length: O = no sprouts

S = <0.5"

M = 0.5 - 1.5"

L = 1.5 - 2.5"

VL = >2.5"

BARC Table 8. Yield, tuber size distribution, and quality characteristics of russets harvested 121 days after planting at Echo Lake in 1991.

Pedigree	Mkt		% Tuber Size Distribution					Internal Defects			
	CWT/A	%Mkt	<2 oz	2-6 oz	6-10 oz	10-16 oz	>16 oz	SG ¹	HH ²	HN ³	No. cut tubers
B0316-36	189	84	16.3	55.2	24.4	4.1	0	94	0	0	16
B0324-25	194	88	10.3	36.0	44.4	7.9	1.5	82	0	0	17
B0324-5	115	89	10.6	58.3	28.9	2.1	0	86	0	0	3
B0326-15	111	84	16.1	66.2	16.0	1.6	0	91	0	0	3
B0329-1	155	85	14.2	53.0	24.4	7.6	0.8	84	1	0	17
B0329-10	91	66	34.4	58.0	6.3	1.4	0	90	0	0	2
B0332-13	134	77	21.8	60.0	14.2	3.3	0.8	83	0	0	9
B0338-17	229	79	20.2	55.1	20.1	4.1	0.6	82	5	0	20
B0338-2	63	62	38.2	52.6	8.0	1.1	0	73	0	0	1
B0338-9	63	55	45.2	48.9	5.1	0.9	0	82	0	0	1
B0339-1	172	86	13.9	54.1	26.1	5.9	0	77	0	0	13
B0362-2	158	84	15.9	51.5	32.0	0.6	0	96	0	0	6
B0427-7	175	77	22.9	54.3	19.5	2.7	0.6	81	0	0	14
B0455-27	128	77	20.7	51.8	16.3	8.7	2.4	79	0	2	18
B0455-8	172	91	9.0	42.8	43.9	4.3	0	81	0	0	16
Nemarus	220	89	9.9	37.9	43.8	7.6	0.8	78	0	0	20
Russet Burbank	176	78	21.8	40.8	28.8	8.6	0	74	0	0	16
Russette	157	90	10.2	46.0	41.5	2.2	0	85	1	0	5
LSD (.05)	33							03			

^{1, 2, 3} See Table 1

BARC Table 8 (continued)

Temperature		50°F		45°F		40°F		40°-70°F		50°F		45°F		40°F		40°-70°F	
Date	Pedigree	Fry ⁴	Spt ⁵	Fry Spt	1/23	Fry Spt	1/27	Fry Spt	1/23	Fry Spt	2/4	Fry Spt	2/5	Fry Spt	2/11	Fry Spt	2/25
	B0316-36	3.0	M	3.1	M	3.5	S	2.4	S	2.6	VL	2.6	M	3.6	S	2.6	M
	B0324-25	3.1	M	3.7	M	4.1	S	3.0	S	3.3	VL	3.3	M	4.6	S	3.1	VL
	B0324-5	2.6	L	2.6	M	3.0	M	2.3	M	2.8	VL	2.4	VL	3.1	M	2.7	L
	B0326-15	2.3	L	2.7	M	3.0	S	2.4	M	2.5	VL	2.7	L	3.4	S	3.1	M
	B0329-1	3.7	L	4.0	M	4.8	S	3.8	M	4.0	VL	4.3	M	4.5	S	3.3	L
	B0329-10	2.4	S	2.9	S	3.8	O	2.8	S	2.7	M	3.3	S	4.2	S	2.6	M
	B0332-13	2.9	M	3.7	S	4.0	S	3.1	S	3.0	VL	3.5	S	4.6	S	3.4	M
	B0338-17	3.9	S	3.9	S	3.7	S	3.6	S	3.8	M	4.2	S	4.3	S	3.7	VL
	B0338-2	3.4	S	4.4	S	4.7	S	4.4	S	3.8	L	4.3	S	5.0	S	4.8	M
	B0338-9	3.8	M	4.0	M	4.6	S	4.0	M	3.9	VL	3.8	M	4.7	S	4.3	M
	B0339-1	2.8	L	2.8	M	3.3	S	3.2	M	2.6	VL	3.0	L	3.5	S	2.9	VL
	B0362-2	2.4	L	2.5	L	3.5	S	2.3	M	2.9	VL	2.8	VL	3.5	S	2.5	VL
	B0427-7	2.8	L	3.3	L	3.7	M	3.0	M	3.4	VL	3.3	L	4.1	M	3.0	L
	B0455-27	3.7	S	4.5	S	5.0	S	4.4	S	3.8	M	4.7	S	5.0	S	4.8	M
	B0455-8	3.1	M	3.7	S	4.7	S	3.4	S	3.1	L	3.5	S	4.8	S	3.6	M
	Nemarus	2.6	VL	3.4	M	3.6	S	3.2	M	3.0	VL	3.1	VL	3.9	S	3.7	VL
	Russet Burbank	4.5	O	4.5	O	4.5	O	4.1	S	4.1	S	4.5	O	5.0	O	4.6	S
	Russette	4.0	S	4.3	S	4.5	S	3.3	S	3.9	VL	3.9	S	4.6	S	3.1	M

4 Fry: 1-3 = Satisfactory

5 Sprout length: O = no sprouts

S = <0.5"

M = 0.5 - 1.5"

L = 1.5 - 2.5"

VL = >2.5"

BARC Table 9. Yield, tuber size distribution, and quality characteristics of russets harvested 121 days after planting at Echo Lake in 1991.

Pedigree	Mkt CWT/A	%Mkt	% Tuber Size Distribution					SG ¹	Internal Defects	
			<2 oz	2-6 oz	6-10 oz	10-16 oz	>16 oz		HH ² HN ³	No. cut tubers
B0478-25	151	82	18.3	55.6	21.7	4.4	0	83	0	19
B0493-8	238	88	5.6	26.6	42.3	18.8	6.7	77	0	20
B0502-22	178	89	11.2	36.1	43.0	9.7	0	92	0	15
B0524-9	134	75	24.5	57.2	17.1	1.2	0	80	0	8
B0647-1	192	92	6.5	28.5	41.4	22.4	1.2	72	0	20
B0649-5	175	91	8.2	46.0	33.2	11.7	0.8	80	0	20
B0655-3	127	74	26.2	54.7	15.6	3.6	0	82	0	15
B0663-12	65	65	35.0	59.0	6.1	0.0	0	73	0	1
B0663-18	32	45	55.0	45.0	0.0	0.0	0	80	-	--
B0663-5	141	84	13.2	51.1	27.3	5.4	2.9	78	0	1
B0668-23	65	59	41.3	53.6	4.2	0.9	0	74	0	2
B0671-19	121	80	20.5	59.6	19.1	0.8	0	79	0	9
B0671-22	135	72	28.1	62.5	9.4	0.0	0	87	0	10
B0672-9	183	89	9.2	32.0	43.8	13.6	1.4	78	0	20
B0683-3	129	85	13.2	57.4	22.9	4.4	2.1	76	1	16
Coastal Russet	170	89	11.2	59.4	25.1	4.3	0	73	0	20
Russet Burbank	165	77	22.9	55.1	17.4	4.6	0	76	0	20
Russette	179	92	7.1	43.8	46.8	1.6	0.8	87	0	20
LSD (.05)	26							03		

^{1,2,3} See Table 1

BARC Table 9 (continued)

Temperature	50°F	45°F	40°F	40°-70°F	50°F	45°F	40°F	40°-70°F
Date	1/14	1/24	1/27	1/23	2/5	2/6	2/13	2/26
Pedigree	Fry ⁴ Spt ⁵	Fry Spt	Fry Spt	Fry Spt	Fry Spt	Fry Spt	Fry Spt	Fry Spt
B0478-25	3.7 M	4.1 M	4.4 S	3.7 M	4.1 VL	3.8 L	4.8 M	4.3 M
B0493-8	5.0 VL	5.0 L	4.9 S	4.6 M	4.6 VL	4.7 L	5.0 S	4.8 VL
B0502-22	3.0 S	2.9 S	3.3 O	2.5 S	3.0 S	3.0 S	3.9 S	2.5 S
B0524-9	2.8 M	2.8 M	3.7 S	3.2 S	2.6 L	2.7 M	3.9 S	3.1 M
B0647-1	2.8 S	3.4 S	4.0 O	3.4 S	3.4 S	3.6 S	4.5 O	3.7 M
B0649-5	3.1 S	3.0 S	4.0 S	2.9 S	3.1 M	3.0 S	4.0 S	2.7 M
B0655-3	2.4 VL	2.5 M	3.4 S	2.5 S	2.6 VL	2.4 M	3.7 S	2.9 M
B0663-12	2.9 S	3.4 O	4.0 O	3.2 S	2.9 M	3.3 S	4.6 O	4.0 S
B0663-18	3.2 S	3.4 S	4.1 S	2.9 S	3.4 L	3.2 S	4.3 S	3.2 M
B0663-5	2.8 M	2.5 S	3.9 O	2.7 S	3.0 L	2.9 S	4.0 O	3.4 M
B0668-23	2.5 S	3.3 S	4.2 S	2.8 S	3.6 M	3.6 S	4.8 S	3.2 S
B0671-19	3.2 L	3.1 M	4.3 S	3.3 M	2.7 VL	3.1 L	4.2 S	3.6 VL
B0671-22	3.8 M	3.9 S	4.5 S	3.7 M	4.2 VL	4.4 M	4.9 S	2.9 L
B0672-9	3.0 S	3.6 S	4.4 O	3.4 S	3.9 L	3.4 S	4.3 S	3.6 L
B0683-3	3.0 O	3.6 O	4.2 O	3.0 S	3.2 S	3.7 S	4.2 O	2.7 S
Coastal Russet	4.8 M	4.7 S	5.0 S	4.9 M	4.9 L	5.0 S	5.0 O	4.7 M
Russet Burbank	4.6 O	4.9 O	5.0 O	4.5 S	4.4 S	4.6 O	4.9 O	4.5 S
Russette	4.1 S	4.2 S	4.8 S	3.1 M	4.0 VL	4.6 S	4.8 S	3.1 M

4 Fry: 1-3 = Satisfactory

5 Sprout length: O = no sprouts

S = <0.5"

M = 0.5 - 1.5"

L = 1.5 - 2.5"

VL = >2.5"

BARC Table 10. Yield, tuber size distribution, and quality characteristics of red skin potatoes harvested 122 days after planting at Echo Lake in 1991.

Pedigree	Mkt		% Tuber Size Distribution						Internal Defects			
	CWT/A	%Mkt	<1 1/8"	1 1/8"-2 1/4"	2 1/4"-3 1/4"	3 1/4"-4"	>4"	SG ¹	HH ²	HN ³	No. cut tubers	
B0032-40	87	70	29.8	59.7	10.6	0.0	0	67	--	--	--	
B0033-23	177	89	10.9	56.4	32.7	0.0	0	67	0	0	5	
B0615-1	139	85	15.4	50.9	33.6	0.0	0	62	0	0	3	
B0615-2	138	79	21.2	52.7	24.5	1.7	0	66	0	0	4	
B0616-1	149	85	15.2	47.6	36.1	1.0	0	70	0	0	6	
B0616-4	181	86	14.1	46.6	38.7	0.6	0	69	1	1	6	
B0800-12	132	78	21.6	49.6	28.8	0.0	0	75	0	0	5	
B0806-13	155	85	15.5	53.9	30.7	0.0	0	70	0	0	10	
B0808-3	147	72	28.5	48.7	22.8	0.0	0	83	0	0	1	
B0808-4	137	71	28.8	51.5	19.0	0.7	0	83	0	0	2	
B0811-13	183	89	11.4	46.1	39.9	2.5	0	69	0	0	15	
B0811-2	158	71	29.0	54.8	16.2	0.0	0	72	--	--	--	
La 12-59	249	96	4.0	27.7	57.4	10.8	0	74	2	0	20	
La Rouge	178	90	10.2	40.8	46.8	2.3	0	73	1	0	8	
Norland	136	84	15.8	48.5	35.7	0.0	0	63	0	0	5	
Reddale	211	96	4.3	12.8	67.0	15.9	0	64	1	0	20	
Red La Soda	196	92	6.5	31.6	53.5	7.3	1.1	72	0	0	20	
Red Pontiac	298	96	3.9	31.1	57.5	7.4	0	62	3	0	20	
LSD (.05)	35							03				

^{1, 2, 3} See Table 1

BARC Table 10 (continued)

Temperature		50°F	45°F	40°F	50°F	45°F	40°F	40°-70°F	50°F	45°F	40°F	40°-70°F
Date		1/10	1/24	1/15	2/7	2/7	2/11	2/25				
Pedigree	Chip ⁴ Spt ⁵	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt
B0032-40	9.0 S	9.4 S	10.0 O	8.9 S	9.2 M	9.7 S	10.0 O	9.7 S	10.0 O	9.7 S	10.0 O	9.7 S
B0033-23	9.3 M	9.7 S	10.0 O	9.3 S	9.6 M	9.3 S	10.0 O	9.3 S	10.0 O	9.6 S	10.0 O	9.6 S
B0615-1	8.8 L	8.5 M	10.0 S	8.0 S	8.3 L	8.9 S	9.9 S	8.9 S	9.9 S	9.1 S	9.9 S	9.1 S
B0615-2	8.8 M	8.5 S	9.6 O	8.4 S	8.1 M	9.3 O	9.9 O	9.3 O	9.9 O	8.3 S	9.9 O	8.3 S
B0616-1	9.5 M	10.0 M	10.0 O	9.9 S	10.0 M	9.9 S	10.0 O	9.9 S	10.0 O	10.0 S	10.0 O	10.0 S
B0616-4	8.8 S	9.3 S	9.8 O	9.1 S	8.7 M	9.3 S	9.9 O	9.3 S	9.9 O	9.1 S	9.9 O	9.1 S
B0800-12	7.6 M	8.1 S	8.8 O	7.9 S	7.8 M	8.4 S	9.5 O	8.4 S	9.5 O	8.9 S	9.5 O	8.9 S
B0806-13	7.5 VL	7.9 VL	8.6 M	8.3 L	8.9 VL	8.4 VL	9.4 M	8.4 VL	9.4 M	9.6 VL	9.4 M	9.6 VL
B0808-3	9.1 L	9.4 S	9.8 S	8.8 S	9.7 VL	9.9 M	10.0 S	9.9 M	10.0 S	9.9 M	10.0 S	9.9 M
B0808-4	9.3 L	9.3 S	9.8 S	9.4 S	9.6 VL	9.9 M	10.0 S	9.9 M	10.0 S	9.8 M	10.0 S	9.8 M
B0811-13	9.3 M	9.3 S	10.0 O	9.5 S	9.4 S	9.9 S	10.0 O	9.9 S	10.0 O	9.9 S	10.0 O	9.9 S
B0811-2	9.7 M	9.6 M	9.8 O	9.9 S	9.7 M	10.0 M	10.0 O	9.7 M	10.0 M	9.8 M	10.0 O	9.8 M
La 12-59	8.5 L	8.6 S	9.6 O	9.0 S	9.3 VL	9.3 M	9.9 O	9.3 M	9.9 O	9.2 M	9.9 O	9.2 M
La Rouge	9.6 S	9.5 S	9.9 O	9.9 S	9.6 M	9.8 L	10.0 O	9.8 L	10.0 O	9.8 S	10.0 O	9.8 S
Norland	8.3 L	8.8 S	9.9 O	9.0 M	8.8 VL	9.3 M	10.0 O	9.3 M	10.0 O	9.6 VL	10.0 O	9.6 VL
Reddale	9.2 M	9.7 S	10.0 O	9.3 S	10.0 VL	10.0 S	10.0 O	10.0 S	10.0 O	9.7 M	10.0 O	9.7 M
Red La Soda	9.3 S	9.5 S	9.5 O	8.6 S	9.5 M	9.3 S	10.0 O	9.3 S	10.0 O	8.9 S	10.0 O	8.9 S
Red Pontiac	9.9 M	10.0 S	10.0 S	10.0 S	10.0 L	10.0 L	10.0 S	10.0 L	10.0 S	10.0 M	10.0 S	10.0 M

4 Chips: 1-7 = Satisfactory

5 Sprout length: O = no sprouts

S = <0.5"

M = 0.5 - 1.5"

L = 1.5 - 2.5"

VL = >2.5"

INTER-REGIONAL POTATO INTRODUCTION PROJECT (IR-1)

J.B. Bamberg

Introduction of
New Stocks

Dr. Spooner participated in a successful collecting expedition to Ecuador in the spring. Collecting collaboratively with Ecuadorian scientists, Dr. Spooner acquired true seed of 20 non-tuber-bearing and 108 tuber-bearing Solanum accessions with herbarium vouchers for each. Dr. J. Peter Hjerting collected in Mexico in the fall of 1991 and has donated 12 tuber-bearing Solanum accessions to IR-1.

Preservation and
Increase of Stocks

Two large screenhouses were built in the spring of 1991 by IR-1 staff. These have been used to perform summer seed increases. Refinements in fall (September-January) greenhouse seed increases also continue. These measures are being taken in an effort to expand seed increase capacity at minimum cost. As a result, a total of 621 seed increases were performed in 1991, more than a 50% increase compared to recent years.

The collection is growing. The following were assigned PI numbers in 1991: 128 accessions from Dr. Spooner's 1988 Mexico expedition, 108 accessions from Dr. Spooner's 1989 Chile expedition, 110 accessions from Dr. Spooner's 1990 Argentina/Chile expedition. Over 130 unsolicited clonal stocks were received from Quarantine. This gave us a total of 479 new accessions. Of these accessions, 303 now have been systematized and have sufficient seed available for distribution. The remainder are in the process of being increased.

IR-1 now has an invitro collection of 465 items. These include varietal clones, genetic stocks and families of rare accessions which have repeatedly resisted seed increases.

This year a total of 968 potato spindle tuber viroid (PSTV) tests were performed on seed increase parent plants, newly increased seedlots, and research materials.

In 1991, germination percentages for 900 seedlots were determined.

A complete computer inventory of all true seed stocks was developed, including amount of seed on hand and germination. In the near future, seed orders will be distributed as grams of seed equivalent to approximately 50 seeds. When orders are entered into the computer, the amount expended will automatically be subtracted from the inventory, thus maintaining a continuous account of the number of grams of seed in stock. This will greatly aid in assessing priorities for seed increases.

The upgraded computer database will serve as a source for a new catalog of IR-1 stocks, for which printing preparations have

been made. Since our last publication of 3,000 accessions, over 1,000 accessions have been added to the collection.

IR-1 took inventory of its herbarium specimens. There are 3,681 mounted specimens and 1,375 unmounted specimens, representing 1,754 different accessions in the IR-1 herbarium. This leaves 2,191 unrepresented, and 952 under-represented accessions. Remedy of this situation was given top priority by the Potato Crop Advisory Committee (CAC). Thus, Drs. Bamberg and Spooner applied for and received an ARS grant of \$17,500 to upgrade the IR-1 herbarium in 1992 to the NPGS recommendations. This will provide a herbarium of three mounted and labeled specimens of each accession to be used for vouchers, research, and distribution.

Classification

Taxonomic determinations were performed on numerous plantings by Dr. Spooner. Dr. Spooner also continued research on species relationships in collaboration with Dr. Andrea Clausen (Argentina) and Dr. Ronald van den Berg (Netherlands), to provide a more stable and meaningful taxonomy for IR-1 stocks.

Distribution

Over 7,800 samples of seed, tuber, and invitro stocks were sent to potato workers in 26 states of the United States and in 18 other countries in 1991. The volume and types of stocks sent to various consignee categories are summarized in the table below:

VOLUME AND TYPES OF STOCKS DISTRIBUTED

Category	Units ¹					accessions
	S	TF	IVS	RPS	Total	
Domestic	4,410	1,222	664	12	6,308	5,034
Foreign	1,084	26	423	9	1,542	900
IR-1 use ²	3,738	0	0	0	3,738	3,738
Total	9,293	1,248	1,087	21	11,588	9,672

¹ Types of Stocks sent/(Number of seeds, tubers or plantlets per standard shipping unit): S= True Seeds/(50), TF= Tuber Families/(10), IVS= in vitro Stocks (1), RPS= USDA-WI Cooperative Research Program Stocks.

² Includes chromosome counts, germination tests, ID and taxonomic check plantings, in vitro maintenance, seec increases, PSTV tests, research and miscellaneous plantings. Not included are 1,809 accessions sent to NSSL and Madison for safety backup.

The tuber family orders tabulated above were requested from a listing of 235 accessions mailed to approximately 400 cooperators worldwide. These first generation tubers from disease

tested parents are the only tubers currently distributed by IR-1. Other clonal stocks are distributed exclusively invitro.

DOMESTIC DISTRIBUTION BY REGION

Region	Units		Orders	
	Shipped	% of Total	Shipped	% of Total
North Central	4,513	72	57	57
North Eastern	702	11	18	18
Southern	118	2	8	8
Western	975	15	17	17
TOTAL:	6,308	100	100	100

Evaluation of Stocks

"Fine screening" of six accessions resistant to Colorado potato beetle was performed, funded in part by ARS in cooperation with Drs. Radcliffe and Lauer of the University of Minnesota. It was determined that all individuals in the reportedly resistant populations tested are highly resistant and can, therefore, be used by breeders without additional screening and selection. IR-1 staff research continues to characterize useful traits in the collection. A sample of 21 species was screened for high tuber calcium, a trait strongly associated with resistance to tuber defects. Species were also identified which are greatly superior to cultivar checks. Experiments were conducted to determine the physiological and genetic basis of frost tolerance in a variety of species in the collection.

Intergenebank Collaboration

Potato germplasm is a precious international treasure which must be protected and utilized as effectively as possible. IR-1 and its sister genebanks around the world have recognized that this can best be done through intergenebank collaboration, and held the inaugural meeting of the Association of Potato Intergenebank Collaborators (APIC) at IR-1 in August, 1991. The Association began specific projects including a joint database, sharing of evaluation data and technical procedures, professional exchanges, cooperation on prioritization and organization of collecting expeditions, reciprocal safety backups, and cooperative research. This global approach will help us more efficiently and effectively manage potato genetic resources, and improve international understanding and cooperation.

Usefulness of Findings

IR-1's purpose is to provide a ready source of raw materials, technology and information which support potato breeding and research in the U.S. and around the world. Thus, one way the

success of IR-1 can be measured is by the use of IR-1 germplasm in the pedigrees of new, improved potato cultivars. Another is in the use of IR-1 stocks in research programs which also ultimately contribute to mankind's exploitation of the potato crop.

Five varietal releases were published in the U.S. in 1991: 'Castile', 'Frontier Russet', 'Gemchip', 'LaBelle', and 'Niska'. These all have introduced germplasm in their pedigrees, as is now the case with 196 of 202 varieties released in the U.S. since 1932.

Research conducted in the United States and other countries provide evidence of the importance of continued utilization of the IR-1 germplasm collection. IR-1 has documented 71 papers, 25 abstracts, and seven theses reporting the use of IR-1 Solanum introductions in 1991.

USDA, AGRICULTURAL RESEARCH SERVICE, MADISON, WISCONSIN

R.E. Hanneman, Jr. and D.M. Spooner

Progress on
enhancement

Efforts were concentrated on getting the enhancement program utilizing wild and cultivated species firmly underway. The program was moved from the Inter-Regional Potato Introduction Station at Sturgeon Bay to the U.W. Lelah Starks Potato Breeding Farm at Rhineland, Wisconsin. Here 394 accessions of wild and cultivated species previously shown to have resistance to major pests were grown and crossed with Tuberosum haploids and cultivars to provide seed for the next generation for selection. Over 10,000 hybrid seedlings were grown in a greenhouse to produce tubers for first year selection next year. In addition, field selection was done on 152 families, totalling 3621 clones of first year seedlings (Tables 1-5) and 651 second and third year selections. The selections will be shared with cooperating breeding programs.

Ecuador, 1991 Potato
Collecting Expedition

A joint Ecuador/Colombia/United States wild potato (Solanum sect. Petota) germplasm collecting expedition was conducted in Ecuador from April 13-July 1, 1991. Field participants, affiliations, and dates of collection follow: Luis E. López J. (IBPGR) and David M. Spooner (USDA, ARS) collected during the entire expedition; Raul Castillo T. (INIAP) collected from April 29-June 2, June 18-22, and otherwise coordinated all phases of collecting in Ecuador. Jaime Estrella (INIAP) collected from April 16-18, 20, June 30; Cesar Tapia (INIAP) April 23-25, June 5-12, 27; Patricio Yañez (Universidad Católica) June 11-15. In addition, Francisco Muñoz (CIP), Ricardo Rodriguez (CIP), Elías Guadalupe (town of Guamate, Prov. Chimborazo Municipality officer), José Valásquez (Universidad Católica), and Paul Birdsall (United States Embassy, Ecuador) collected on April 25, April 28, June 19-21, June 27 and June 27, respectively.

Ecuador was targeted by the Technical Advisory Committee of the Inter-Regional Potato Introduction Project (IR-1) as a high priority area for collection because of its large number of wild potato taxa, combined with its low number of germplasm holdings. Prior to this trip, we documented 25 taxa accepted for Ecuador by Correll, Ochoa, or Hawkes. The prior germplasm holdings of these taxa at IR-1 are listed in Table 1.

The goal of the expedition was to collect germplasm of all of the Ecuadorian taxa. Prior to the expedition, we assembled all of the original description literature and localities from existing Ecuadorian germplasm accessions. Advice of collecting sites and priorities was obtained by letters from Carlos Ochoa (CIP) and Jack Hawkes (University of Birmingham). Records were also obtained from inspection of

Table 1: 2x(2EBN) Enhancement Species (Field): Country of origin and characters chosen for.

Species	Country*	Colorado					Hapla Chitwoodii					Verti-cillum		Hybrids with 4x	
		Potato beetle	Aphid	Leaf hopper	Flea beetle	Bacterial wilt	Ring rot	Erwinia	nema-tode	nema-tode	Early blight	Verti-cillum	PLRV	Heat	Haploids
<i>S. berthaultii</i>	Bolivia	X		X	X			X		X		X			X
<i>S. boliviense</i>	Bolivia		X								X				
<i>S. bukasovii</i>	Peru									X	X				
<i>S. canasense</i>	Peru					X									
<i>S. chacoense</i>	Argentina	X						X	X						
<i>S. doddii</i>	Bolivia														
<i>S. gourlayi</i> (2x)	Argentina						X								
<i>S. infundibuliforme</i>	Argentina														
<i>S. kurtzianum</i>	Argentina								X						
<i>S. marinasense</i>	Peru		X												
<i>S. medians</i>	Peru		X		X										
<i>S. megistacrolobum</i>	Argentina/Peru														
<i>S. microdonitum</i>	Argentina/Bolivia		X						X						
<i>S. multidissectum</i>	Peru		X												
<i>S. multiinterruptum</i>	Peru			X	X										
<i>S. pampasense</i>	Peru														
<i>S. paucissectum</i>	Peru														
<i>Gp. Phureja</i>	Colombia		X					X	X						
<i>S. raphanifolium</i>	Peru								X						
<i>S. sanctae rosae</i>	Argentina				X	X									
<i>S. sparepilum</i>	Peru								X						
<i>S. spegazzinii</i>	Argentina														
<i>Gp. Stenotomum</i>	Bolivia/Peru								X						
<i>S. tarjense</i>	Argentina/Bolivia	X			X			X	X						
<i>S. toralapanum</i>	Argentina/Bolivia				X			X							
<i>S. vermei</i>	Argentina														
<i>S. verrucosum</i>	Mexico		X												
<i>S. vidaurrei</i>	Argentina		X												
<i>S. violaceimarmoratum</i>	Bolivia			X											

* Country accessions came from, not species range

** () Have hybrids but not with enhancement selections

Table 2: 2x(1EBN) Enhancement Species (Field): Country of origin and characters chosen for.

Species	Country*	Colorado				Hapla				Verti-				Hybrids with 4x haploids cultivars
		Potato beetle	Aphid	Leaf hopper	Flea beetle	Bacterial wilt	Ring rot	Erwinia	nema-tode	Chitwoodii	Early blight	Verti-cillium wilt	PLRV	Heat
<i>S. brachistotrichum</i>	Mexico			X	X			X	X		X			
<i>S. bulbocastanum</i>	Mexico, Guatemala		X	X	X			X	X		X	X		X
<i>S. cardiophyllum</i>	Mexico		X	X	X						X	X		
<i>S. chancayense</i>	Peru										X			
<i>S. commersonii</i>	Argentina, Brazil, Uruguay					X								
<i>S. mochicense</i>	Peru				X									X
<i>S. pinnatisectum</i>	Mexico	X						X			X			
<i>S. trifidum</i>	Mexico	X							X					X

* Country accessions came from, not species range

Table 3: 4x(2EBN) Enhancement Species (Field): Country of origin and characters chosen for.

Species	Country*	Colorado				Hapla				Verti-				Hybrids with 4x haploids cultivars
		Potato beetle	Aphid	Leaf hopper	Flea beetle	Bacterial wilt	Ring rot	Erwinia	nema-tode	Chitwoodii	Early blight	Verti-cillium wilt	PLRV	Heat
<i>S. acaule</i> ssp. <i>acaule</i>	Argentina, Bolivia, Peru													
<i>S. acaule</i> ssp. <i>punae</i>	Peru		X			X	X		X		X		X	
<i>S. agrimonifolium</i>	Guatemala			X		X					X			
<i>S. fendleri</i>	Mexico													
<i>S. hjertingii</i>	Mexico		X										X	
<i>S. papita</i>	Mexico								X					
<i>S. polytrichon</i>	Mexico					X			X				X	
<i>S. stoloniferum</i>	Mexico		X		X			X					X	X

* Country accessions came from, not species range

Table 4: 4x(4EBN) Enhancement Species (Field): Country of origin and characters chosen for.

Species	Country*	Colorado					Hapla Chitwoodii			Verti- cillium wilt		Hybrids with 4x		
		Potato beetle	Aphid	Leaf hopper	Flea beetle	Bacterial wilt	Ring rot	Erwinia	nema-tode	nema-tode	Early blight	PLRV	Heat	haploids cultivars
Gp. Andigena	1		X					X	X			X		X
S. gourlayi	Argentina							X	X					X
S. sucrense	Bolivia		X					X	X					X
Gp. Tuberosum	Chile, Mexico							X	X					X

1 = Argentina, Bolivia, Chile, Colombia, Guatemala, Mexico, Peru

* Country accessions came from, not species range

Table 5: 6x(4EBN) Enhancement Species (Field): Country of origin and characters chosen for.

Species	Country*	Colorado					Hapla Chitwoodii			Verti- cillium wilt		Hybrids with 4x		
		Potato beetle	Aphid	Leaf hopper	Flea beetle	Bacterial wilt	Ring rot	Erwinia	nema-tode	nema-tode	Early blight	PLRV	Heat	haploids cultivars
S. brachycarpum	Mexico							X			X	X	X	X
S. demissum	Mexico, Guatemala		X			X							X	
S. gueroense	Mexico												X	
S. hougasii	Mexico				X			X	X					
S. iopetalum	Mexico		X									X		
S. oplocense	Argentina, Bolivia													X

* Country accessions came from, not species range

herbarium vouchers at Ecuadorian herbaria. These localities, and those from Correll (1962) formed our initial collecting priorities.

Collecting was done on many passable roads throughout Ecuador by jeep, or in other areas by horseback or on foot. Germplasm samples were collected for 111 Ecuadorian accessions of all Ecuadorian species except S. calacalinum (Table 2). Taxonomic studies indicate that many of the species formerly recognized for Ecuador are synonyms.

ARS-Wisconsin, Table 1. Ecuadorian germplasm holdings at IR-1 prior to the 1991 expedition of the Solanum sect. Petota taxa accepted by Correll, Ochoa and Hawkes.

<u>Taxon accessions</u>	<u>Ecuadorian accessions</u>	<u>Total</u>
<u>Solanum albornozii</u> Correll	1	1
<u>S. andreanum</u> Baker	0	2
<u>S. baezense</u> Ochoa	0	0
<u>S. burtonii</u> Ochoa	0	0
<u>S. calacalinum</u> Ochoa	0	0
<u>S. chilliasense</u> Ochoa	0	0
<u>S. chomatophilum</u>	0	0
f. <u>angustifolium</u> Correll	0	0
<u>S. colombianum</u> Dun.	1	11
<u>S. correllii</u> Ochoa	0	0
<u>S. cyanophyllum</u> Correll	0	0
<u>S. flahaultii</u> Bitt.	0	0
<u>S. juglandifolium</u> Dun.	0	1
<u>S. minutifolium</u> Correll	0	0
<u>S. moscopanum</u> Hawkes	1	6
<u>S. ochranthum</u> Dun.	2	4
<u>S. paucijugum</u> Bitt.	0	0
<u>S. phureja</u> Juz. & Buk.	2	127
<u>S. pichinchense</u> Bitt. & Sodiro	0	0
<u>S. regularifolium</u> Correll	0	0
<u>S. serratoris</u> Ochoa	0	0
<u>S. solisii</u> Hawkes	1	1
<u>S. suffrutescens</u> Correll	0	0
<u>S. tuberosum</u> ssp. <u>andigena</u> Hawkes	7	698
<u>S. tundalomense</u> Ochoa	5	5
<u>S. tuquerrense</u> Hawkes	1	2

<u>Species</u>	<u>Total New Collections</u>
Non-tuber-bearing species:	
<u>Solanum jugiandifolium</u>	11
<u>S. ochranthum</u>	9
Tuber-bearing species:	
<u>S. acaule</u>	1
<u>S. albornozii</u>	4
<u>S. andreanum</u> ¹	18
<u>S. burtonii</u>	1
<u>S. chilliansense</u>	2
<u>S. colombianum</u> ²	29
<u>S. paucijugum</u> ³	10
<u>S. minutifolium</u>	2
<u>S. phureja</u>	2
<u>S. regularifolium</u> ⁴	1
<u>S. tuberosum</u> ssp. <u>andigena</u>	1
<u>S. tuquerrense</u>	13
"unidentified" ⁵	2

- ¹ Included here are S. baezense, S. cyanophyllum, S. pichinchense, S. serratoris, and S. suffrutescens.
- ² Provisionally included here are: Solanum chomatophilum f. angustifolium, all the varieties of S. colombianum, S. moscopanum, and S. solisii. These may be good species, but we currently are unable to reliably distinguish all of these taxa.
- ³ Included are accessions that may later prove to be S. flahaultii.
- ⁴ Includes S. corellii.
- ⁵ Only tubers were located.

Reexamination of sub-species boundaries within Solanum microdontum

Solanum microdontum Bitter is a highly variable species distributed from northern Bolivia to northwestern Argentina. It is a member of sect. Petota, a group of 232 species as interpreted by Hawkes (1990). Many of these species are morphologically very similar, but S. microdontum stands out as one of the morphologically more distinctive members of the group. Many populations of S. microdontum are distinguished by large entire leaves, but intra- and interpopulational variability encompass morphotypes with pinnately-dissected leaves similar to other wild species. The great range of variability has been divided in as many as six species, three subspecies, and six varieties, but current classifications reduce this variability to two subspecies, ssp. microdontum and ssp. gigantophyllum (Bitter) Hawkes and Hjerting (Hawkes 1990) or three varieties, var. microdontum, var.

metriophyllum Bitter, and var. montepuncoense Ochoa (Ochoa 1990). The latter variety is hypothesized by Hawkes and Hjerting to be a natural interspecific hybrid between S. violaceimarmoratum Bitter and S. microndontum. Variety microndontum and var. metriophyllum are equivalent nomenclaturally to ssp. microndontum and ssp. gigantophyllum, respectively. This study investigates the morphological and geographical patterns of variability in S. microndontum.

The present study reexamines two of these taxa (herbarium specimens or germplasm were unavailable for the third) using morphological data of 21 characters of four individuals each of 72 accessions from the majority of the range of the species, planted in a single experimental field (Tables 1,2). Sixty-nine accessions were chosen from the genebank holdings of S. microndontum at IR-1. Identities of the accessions were obtained from Hawkes and Hjerting (1969, 1989) supplemented by identities in Hanneman and Bamberg (1986). These latter identifications were provided by J.G. Hawkes, C.M. Ochoa, and other visiting taxonomists from living germplasm accessions planted at the Inter-Regional Potato Introduction Station for identification. For convention, we used the subspecies designations of Hawkes (1990). Thirty-one of these were identified as ssp. gigantophyllum, 19 as ssp. microndontum, 13 as "intermediates" and six were undesignated as to subspecies. The accessions were chosen to maximize the taxonomic and geographical diversity in the group, and they cover the majority of the range of S. microndontum. All accessions were mapped and assigned to one of 29 generalized regions. Our results indicate that the characters used to recognize infraspecific taxa have no correlation with habitat or geography and often vary within accessions. We conclude that infraspecific taxa are not warranted for S. microndontum.

ARS-Wisconsin, Table 1. Characters and states used in numerical phenetics of Solanum microndontum. Terminology after Hawkes (1990).

<u>Habit</u>	1. Plant height (cm).
<u>Stem</u>	2. Diameter (mm). 3. Wing width (mm). 4. Wing morphology: undulate (0), straight (1).
<u>Leaves</u>	5. Leaf length (cm). 6. Leaf width (cm). 7. Ratio of leaf length/length from axis of widest point of leaf to apex. 8. Terminal leaflet length (cm). 9. Terminal leaflet width (cm). 10. Number of primary lateral leaflet pairs. 11. Number of secondary and tertiary interjected lateral leaflets.
<u>Peduncle</u>	12. Length (cm).
<u>Pedicel</u>	13. Length (mm). 14. Ratio of pedicel length/length from base of pedicel to articulation.
<u>Inflorescence</u>	15. Flower number.
<u>Calyx</u>	16. Total length (mm). 17. Ratio of total length/lobe length. 18. Acumen length.
<u>Corolla</u>	19. Diameter to apex of corolla lobe (mm). 20. Ratio of diameter to apex of corolla lobe/diameter to base of corolla lobe. 21. Ratio of width of corolla lobe at base/length from a line drawn across widest point of corolla lobes (Ratio 2, R2).

ARS-Wisconsin, Table 2. Comparison of Solanum microdontum ssp. microdontum and ssp. gigantophyllum from the literature.

<u>Character</u>	<u>ssp. microdontum</u>	<u>ssp. gigantophyllum</u>
Habit	spreading	upright or decumbent
Plant height	up to 0.5 m	up to 2 m
Tuber diameter	0.5-1 cm	1-5 cm
Stem diameter	1.5-3(-5) mm	3-10 (-20) mm
Stem wing width	0-1(-2.5) mm	2-5 mm
Stem wing margin	straight, entire	undulate, denticulate
Terminal leaflets	8 cm long; 5 cm wide	8-18 cm long; 4-9 cm wide
Inflorescence	1-8(-15) flowers	5-20(-35) flowers
Distribution	Bolivia, Argentina, 18°S-24°S	Bolivia, Argentina, 17°S-29°S
Habitat	1600-3200m elev; rain, cloud; forests, alpine; meadows	100-3200m elev; rain, cloud; forests, grassy; meadows, dry scrub; forests, agr. weed

1991 NORTH CENTRAL REGIONAL POTATO TRIALS

R. H. Johansen and Cooperators^{1/}

The North Central Regional Potato Variety Trials have been in existence since 1950. In 1991, there were 11 states and three provinces conducting trials. The trial in Louisiana was again lost due to flooding and wet conditions.

Cultivars Recently Released:

Year	Name	Sel. No.	Parentage	Released by:
1990	Snowden	W855	B5141-6 x Wischip	Wisconsin

Cooperating States and Provinces:

State or Province	Date Planted	Date Harvested	Total Days to Harvest
Alberta	5/22	10/3-4	136
Manitoba	5/10	9/10	131
Ontario	5/1	9/17	140
Indiana	4/16	8/1	108
Iowa	4/23	8/7	107
Louisiana	Trial was lost due to flooding.		
Michigan	5/13	9/25	136
Minnesota	4/17	8/20	95
Nebraska	5/10	9/17	131
New Jersey	4/4	8/6	125
North Dakota	5/20	9/23	127
Ohio	5/15	10/2	141
South Dakota	4/24	9/5-6	136
Wisconsin	4/27	9/25	152

Environmental Conditions: Soil type ranged from clay loam to sand; however, most trials were grown on lighter sandy loam. Some trials were irrigated.

^{1/} Alberta, Mr. Clive Schaupmeyer; Manitoba, Mr. Brian Rex; Ontario, Mr. Gary Johnston; Indiana, Dr. Hommer Erickson; Iowa, Dr. Bill Summers; Louisiana, Dr. William Young; Michigan, Dr. Richard Chase and Dr. Dave Douches; Minnesota, Dr. Florian Lauer; Nebraska, Dr. Alexander D. Pavlista; New Jersey, Dr. Mel Henninger; Ohio, Dr. Mark A. Bennett; South Dakota, Dr. Paul Prashar; Wisconsin, Dr. Stan Peloquin, Dr. Dave Curwen, Mr. Brian Bowen.

Cultural Practices: Fertilizers, insecticides, herbicides, vine killers, etc. were all based on local conditions. Some of the fungicides used were Bravo 75 WP, Marlate, Mancozeb, Pencozeb, Dithane M-45. Insecticides used were Asana, Sevin, Ambush, Thiodan 3EC, Rotenone, Vydate, Thimet, Monitor, Kyocide, Cygon, Imidon, Pounce and Guthion. The common herbicides were Lexone, Poast, Dual 8E, Lorox and Sencor.

Weather Conditions: The northern states and provinces received fairly good moisture during the season and had good growing conditions. Rainfall in North Dakota was near normal while Minnesota was extremely wet. It was dry and hot in Indiana and Nebraska had above normal rainfall and near normal temperatures. It was dry and hot in New Jersey. Ohio had fairly good moisture, however, it was warm during part of the season.

Entries: Entries were received from Michigan, Wisconsin, Louisiana, Minnesota and North Dakota. The check varieties supplied by North Dakota were Norchip, Norgold Russet, Norland, Russet Burbank and Red Pontiac.

Total and US No. 1 Yield: The highest yielding entry for total and U.S. No. 1 yield was Red Pontiac. Over the past 40 years Red Pontiac has generally been the highest yielding entry. The production of certified seed of Red Pontiac in the U.S. and Canada has declined rapidly the past few years. Other high yielding entries were Norchip, LA12-59, MN12567, ND1538-1Russ, Wisc. 870 and ND1871-3R. MS 402-8 was the lowest yielding entry. Minnesota and Wisconsin produced the highest yields (North Central Regional Trial Tables 1 and 2).

Percent U.S. No. 1: Very little differences occurred between all entries in trial with the exception of Russet Burbank (North Central Regional Trial Table 3).

Maturity: Norland was the earliest maturing entry and Russet Burbank was the latest. Other entries that were also late were ND1871-3R, Red Pontiac and Wisc. 856. (North Central Regional Trial Table 4).

Percent Total Solids: Wisc. 870 and Wisc. 856, with an average total solids of 22.8%, were the highest. Norland and Red Pontiac were once again the lowest in total solids (North Central Regional Table 5).

Scab Reaction: Scab was more prevalent in Minnesota and Indiana. Those with the most scab were MS401-1Y, LA12-59 and Red Pontiac. ND1538-1Russ seemed to show the least expression of scab (North Central Regional Trial Table 6).

Summary of Grade Defects: Grade defects varied from location to location. Indiana, Iowa and Minnesota had the most scab. Iowa seemed to have the most growth cracking, while Indiana, Nebraska and Ohio had the most second growth. Manitoba and Minnesota had the most hollow heart while Indiana and New Jersey had the most internal necrosis. New Jersey also had severe vascular discoloration. Several entries are starred to indicate their weakness and breeders should take note. Grade defects are found in North Central Regional Trial Table 7.

Chip Color: Chip color in the North Central Regional Trial Table 8 is reported as either an Agtron reading or by the chip color chart. Several locations again did not report chip data. The three Wisconsin entries and Mich. 401-1Y seem to be the best chippers.

Early Blight: Only North Dakota and Nebraska reported early blight. Data is found in North Central Regional Trial Table 9.

Overall Merit Ratings: North Central Regional Trial Table 10 shows merit ratings for all locations. The following chart shows only the top five selections and for comparison, past ratings are also included.

Selection	Total Points		
	1989	1990	1991
1. Wisc. 870	-0-	39	34
2. ND1538-1Russ	17	26	33
3. ND1871-3R (Tie)	-0-	-0-	21
3. Wisc. 856 (Tie)	-0-	27	21
4. MS 401-1Y	-0-	-0-	19
5. LA 12-59		32	16

North Central Regional Trial Table 1. Total Yield (Cwt./Acre) - 1991.

Cultivar or Selection	Man.	Ont.	Alb.	IN	IA	MI	MN	NE	NJ	ND	OH	SD	WI	Ave.
Early to Medium Early														
Norland	249	270	361	193	202	361	476	295	208	183	156	267	377	277
Norchip	257	271	386	257	216	508	544	316	192	175	173	376	471	319
Norgold Russet	244	300	356	197	165	441	437	214	274	203	137	363	424	289
Medium Late to Late														
MN12567	292	294	502	233	189	672	651	258	287	194	128	496	522	363
MN12966	273	297	399	181	171	436	427	271	161	169	119	358	388	281
MN13035	227	261	360	212	202	435	593	327	260	180	155	357	542	316
MS401-1Y	265	317	365	244	193	430	573	259	208	182	182	288	573	314
MS402-8	154	227	250	0 ^{1/}	161	231	374	96	66	118	71	219	286	188
ND1871-3R	229	316	381	255	193	625	664	231	225	210	117	349	562	335
ND1538-1Russ	263	284	469	270	194	576	586	315	303	220	191	372	489	349
LA12-59	245	280	401	223	159	585	589	336	353	210	206	420	542	350
Wisc. 856	232	287	347	253	196	534	545	272	296	187	141	269	585	319
Wisc. 870	282	296	402	320	218	481	567	295	252	199	160	301	624	338
Wisc. 877	208	225	276	252	182	431	488	223	201	159	145	285	457	272
Red Pontiac	344	391	497	368	191	628	692	396	340	219	170	456	761	420
Russet Burbank	212	268	423	183	183	595	522	250	222	164	166	345	638	321
Average	249	287	386	243	188	498	546	272	241	186	151	345	515	

^{1/} Very low stand

North Central Regional Trial Table 2. US No. 1 Yield (Cwt/Acre) - 1991.

Cultivar or Selection	Man.	Ont.	Alb.	IN	IA	MI	MN	NE	NJ	ND	OH	SD	WI	Ave.
Early to Medium Early														
Norland	199	253	299	ND	194	336	445	283	165	156	136	246	341	254
Norchip	155	245	329	ND	186	459	492	277	160	149	125	347	406	278
Norgold Russet	170	255	264	ND	143	346	415	204	147	164	84	299	363	238
Medium Late to Late														
MN12567	202	261	421	ND	164	576	615	239	243	170	79	447	471	324
MN12966	233	281	343	ND	144	391	412	266	133	145	54	339	355	258
MN13035	110	210	275	ND	158	360	549	304	194	156	105	331	460	268
MS401-1Y	159	285	303	ND	170	378	517	235	172	168	142	257	524	276
MS402-8	119	218	215	ND	156	209	351	96	52	93	55	208	261	169
ND1871-3R	155	294	330	ND	158	570	606	212	175	190	96	318	513	301
ND1538-1Russ	207	252	406	ND	144	505	561	295	192	174	130	329	446	303
LA12-59	176	263	316	ND	135	547	558	318	319	177	157	395	500	322
Wisc. 856	192	269	301	ND	182	516	530	256	222	169	87	257	522	292
Wisc. 870	230	281	327	ND	209	452	550	279	231	177	114	283	547	307
Wisc. 877	136	206	241	ND	155	396	451	202	179	146	120	263	421	243
Red Pontiac	275	371	424	ND	182	568	665	377	232	196	121	440	600	371
Russet Burbank	113	210	266	ND	102	427	492	219	38	99	37	276	457	228
Average	177	260	316		161	440	513	254	178	158	103	315	449	

ND - No data reported.

North Central Regional Trial Table 3. Average Percent US No. 1 (over 2" diameter) - 1991.

Cultivar or Selection	Man.	Ont.	Alb.	IN	IA	MI	MN	NE	NJ	ND	OH	SD	WI	Ave.
Early to Medium Early														
Norland	79	94	83	ND	93	93	93	96	86	85	87	92	90	89
Norchip	60	90	85	ND	86	90	90	88	82	85	72	92	86	84
Norgold Russet	70	85	74	ND	87	78	95	95	64	81	61	82	86	80
Medium Late to Late														
MN12567	68	89	84	ND	87	86	95	93	88	88	62	90	90	85
MN12966	85	95	86	ND	84	90	96	98	90	86	45	95	91	87
MN13035	48	81	76	ND	79	82	93	93	81	87	68	93	85	81
MS401-1Y	60	90	83	ND	88	88	92	91	82	92	78	89	91	85
MS402-8	77	96	86	ND	97	90	94	100	80	79	78	95	91	89
ND1871-3R	67	93	87	ND	82	91	92	93	85	91	82	91	91	87
ND1538-1Russ	79	89	87	ND	74	88	95	93	77	74	68	88	91	84
LA12-59	71	94	79	ND	85	93	95	95	94	85	76	94	92	88
Wisc. 856	83	94	87	ND	93	96	97	94	83	90	62	96	89	89
Wisc. 870	82	95	81	ND	96	94	97	94	90	89	71	94	88	89
Wisc. 877	65	91	87	ND	85	92	93	89	88	91	83	92	92	87
Red Pontiac	87	95	85	ND	95	91	97	95	88	90	71	97	79	89
Russet Burbank	53	79	63	ND	56	72	95	87	54	61	22	80	72	66
Average	71	91	82		85	88	94	93	82	85	68	91	88	

ND - No data reported.

North Central Regional Trial Table 4. Maturity Classification^{1/} - 1991.

Cultivar or Selection	Man.	Ont.	Alb.	IN	IA	MI	MN	NE	NJ	ND	OH	SD	WI	Ave.
Early to Medium Early														
Norland	1.0	NA	2.5	1.0	ND	1.0	2.0	1.0	2.0	2.0	2.0	1.0	1.5	1.6
Norchip	1.0	NA	3.5	3.0	ND	3.0	2.0	4.0	3.0	3.0	3.0	3.75	3.0	2.9
Norgold Russet	1.0	NA	3.4	2.0	ND	2.0	3.0	3.0	3.0	2.8	3.0	3.0	3.2	2.7
Medium Late to Late														
MN12567	1.0	NA	3.3	3.0	ND	3.0	3.0	2.0	3.0	3.8	4.0	2.0	2.8	2.8
MN12966	1.0	NA	3.1	3.0	ND	1.0	2.0	2.0	2.0	2.5	3.0	1.5	2.2	2.1
MN13035	1.0	NA	3.9	3.0	ND	2.0	2.0	4.0	4.0	3.8	5.0	1.75	3.2	3.1
MS401-1Y	1.0	NA	3.9	3.0	ND	1.0	1.0	3.0	2.0	2.0	3.0	2.0	2.8	2.3
MS402-8	1.0	NA	3.1	--	ND	1.0	2.0	3.0	3.0	2.3	3.0	1.25	3.5	2.3
ND1871-3R	1.0	NA	3.9	4.0	ND	4.0	3.0	4.0	5.0	4.0	5.0	4.0	3.0	3.7
ND1538-1Russ	1.0	NA	3.5	3.0	ND	4.0	3.0	2.0	3.0	3.3	3.0	3.5	2.7	2.9
LA12-59	1.0	NA	3.9	4.0	ND	1.0	2.0	4.0	4.0	3.3	5.0	2.25	3.3	3.1
Wisc. 856	1.25	NA	3.4	4.0	ND	4.0	3.0	5.0	4.0	3.3	4.0	2.75	3.1	3.4
Wisc. 870	1.0	NA	3.5	4.0	ND	2.0	3.0	4.0	3.0	2.5	4.0	2.25	3.4	3.0
Wisc. 877	1.0	NA	3.9	5.0	ND	2.0	3.0	4.0	4.0	3.0	3.0	3.25	3.3	3.2
Red Pontiac	1.25	NA	3.9	4.0	ND	3.0	3.0	4.0	5.0	3.8	4.0	3.0	3.5	3.5
Russet Burbank	1.25	NA	4.5	5.0	ND	4.0	4.0	5.0	5.0	4.8	4.0	4.75	4.0	4.2
Average	1.05	NA	3.6	3.4		2.4	2.6	3.4	3.4	3.1	3.6	2.63	3.0	

1/ 1. Very Early - Norland Maturity 4. Late - Katahdin Maturity ND - No data reported.
2. Early - Irish Cobbler Maturity 5. Very Late - Russet Burbank Maturity
3. Medium - Red Pontiac Maturity

North Central Regional Trial Table 5. Percent Total Solids - 1991.

Cultivar or Selection	Man.	Ont.	Alb.	IN	IA	MI	MN	NE	NJ	ND	OH	SD	WI	Ave.
Early to Medium Early														
Norland	19.9	16.8	18.8	13.9	14.2	14.9	14.7	17.1	14.6	19.2	19.0	16.7	14.8	16.5
Norchip	21.9	19.8	21.8	16.9	16.6	19.4	19.7	19.7	18.8	22.9	21.9	21.0	18.8	19.9
Norgold Russet	20.2	18.1	21.3	15.0	14.3	17.7	17.3	16.2	15.9	20.3	18.7	18.8	16.2	17.7
Medium Late to Late														
MN 12567	21.1	19.0	22.3	14.3	14.1	20.0	18.6	21.6	16.5	22.7	20.4	19.4	17.5	19.0
MN 12966	21.4	19.2	21.8	15.2	14.3	18.3	17.5	18.2	15.6	20.9	19.2	18.6	16.2	18.2
MN 13035	21.0	18.1	19.9	13.5	14.0	16.8	16.7	17.7	15.0	19.9	18.1	17.8	16.7	17.3
MS401-1Y	23.9	21.9	24.0	18.8	15.9	20.6	20.7	20.9	19.7	22.2	23.8	22.6	19.7	21.1
MS402-8	21.0	20.0	21.5	-0-1/	15.5	17.5	18.6	22.9	18.4	19.4	21.5	19.4	16.5	19.4
ND1871-3R	19.3	19.6	19.5	14.1	14.4	17.1	17.1	13.9	15.0	21.6	18.1	17.6	16.5	17.2
ND1538-1Russ	21.3	16.2	21.3	15.2	14.6	18.3	16.9	16.9	15.6	22.2	21.9	18.6	15.6	18.1
LA12-59	22.5	19.6	22.3	14.3	14.0	19.8	18.6	17.7	17.3	21.8	20.0	18.0	17.3	18.7
Wisc. 856	21.2	20.2	21.0	16.7	15.1	21.3	20.9	18.4	18.6	22.7	20.4	20.1	19.7	19.7
Wisc. 870	24.3	24.0	24.8	20.9	19.2	23.2	22.7	19.7	22.4	25.0	25.1	23.8	21.6	22.8
Wisc. 877	25.9	24.6	25.3	18.8	17.6	24.2	23.8	20.7	22.4	24.6	23.4	24.1	21.2	22.8
Red Pontiac	19.1	16.2	19.5	13.7	13.9	17.3	16.7	15.2	14.4	19.2	17.1	18.2	15.8	16.6
Russet Burbank	21.4	20.6	22.7	15.0	15.9	21.5	20.3	14.1	16.8	21.6	ND ²	19.7	19.0	19.1
Average	21.6	19.6	21.7	15.8	15.2	19.2	18.8	18.2	17.3	21.6	20.6	19.7	17.7	

1/Very poor stand
2/No Data

North Central Regional Trial Table 6. Scab Reaction Report. Most Representative Scab (Area Type) - 1991.

Cultivar or Selection	Man.	Ont.	Alb.	IN	IA	MI	MN	NE	NJ	ND	OH	SD	WI
Early to Medium Early													
Norland	T-1	0	1-1	3-2	T-1	0	1-1	0	ND	T-1	0-0	1-1	ND
Norchip	0-0	0	1-1	3-2	0-0	0	1-3	T-1	ND	T-1	T-1	0	ND
Norgold Russet	0-0	0	1-2	3-2	T-1	T-1	1-1	0-0	ND	0-0	T-1	1-1	ND
Medium Late to Late													
MN 12567	0-0	0	2-1	4-3	T-1	0	2-2	T-1	ND	T-1	0-0	1-1	ND
MN 12966	0-0	0	1-1	3-2	2-1	0	3-2	T-1	ND	T-1	T-1	1-1	ND
MN 13035	0-0	0	1-1	3-1	T-1	0	3-2	T-1	ND	T-1	0-0	1-1	ND
MS401-1Y	0-0	0	1-1	2-3	T-5	T-4	4-4	T-2	ND	1-1	T-3	1-1	ND
MS402-8	0-0	0	1-2	0	0-0	0	2-2	T-1	ND	1-1	T-3	1-1	ND
ND1871-3R	0-0	0	1-2	3-3	1-4	0	3-2	T-1	ND	T-1	0-0	0	ND
ND1538-1Russ	0-0	0	1-1	3-3	0-0	0	3-3	0-0	ND	0-0	0-0	1-2	ND
LA12-59	0-0	0	1-1	4-3	2-3	0	3-3	T-1	ND	1-1	T-3	1-1	ND
Wisc. 856	0-0	0	T-1	2-2	0-0	0	3-3	T-1	ND	1-1	T-4	0	ND
Wisc. 870	0-0	0	T-1	0	T-3	T-4	4-5	T-2	ND	T-1	T-1	1-1	ND
Wisc. 877	0-0	0	1-1	3-3	0-0	0	4-4	1-2	ND	1-4	0-0	1-1	ND
Red Pontiac	1-1	0	2-1	2-2	T-2	0	4-5	T-1	ND	T-1	T-1	1-1	ND
Russet Burbank	0-0	0	T-1	3-2	0-0	0	1-1	0-0	ND	0-0	0-0	0	ND

1/ AREA TYPE ND - No data reported

- T = less than 1%
 1 = 1-20%
 2 = 21-40%
 3 = 41-60%
 4 = 61-80%
 5 = 81-100%
- 1 = Small, superficial
 2 = Larger, superficial
 3 = Larger, rough pustules
 4 = Larger pustules, shallow eyes
 5 = Very large pustules, deep holes

North Central Regional Trial Table 7. Summary of Grade Defects - 1991.

Cultivar or Selection	Scab	External				Internal				
		Growth Cracks	Off Shape and Second Growth	Tuber Rot	Sun Green	Total Free of External Defects	Hollow Heart	Internal Necrosis	Vascular Discolor ation	Total Free of Int. Def.
Early to Medium Early										
Norland	5.8	3.8	2.8	0.5	1.2	86.7	0.3	4.3	5.0	92.9
Norchip	5.3	1.7	9.5*	0.3	3.2	82.2	0.4	9.7	11.7*	82.5
Norgold Russet	6.6	2.0	10.9*	0.3	0.5	82.9	5.8*	0.8	1.9	92.2
Medium Late to Late										
MN 12567	9.0	2.9	5.4	0.3	1.0	84.0	0.9	0.6	6.4	92.2
MN12966	7.9	4.7*	3.4	0.2	1.2	84.5	0.8	2.8	3.0	94.4
MN 13035	7.7	1.7	5.6	0.2	1.0	86.0	0.3	1.7	2.3	96.2
MS401-1Y	18.0*	0.3	0.6	0.2	1.1	81.3	3.7*	0.8	1.8	94.7
MS402-8	2.5	1.8	1.2	0.6	4.1	89.4	5.0*	1.0	4.5	89.7
ND1871-3R	11.5	0.8	4.5	0.3	1.0	83.5	0.4	1.3	6.6	92.2
ND1538-1Russ	3.8	5.6*	7.7*	0.3	0.6	83.3	1.8	0.2	1.3	96.8
LA12-59	15.6*	13.7*	4.2	1.6*	0.5	77.6	2.5	0.3	0.9	94.2
W856	6.6	2.1	2.8	0.2	1.1	87.9	1.5	1.8	7.0	84.0
W870	9.1	1.3	2.2	0.1	1.8	86.6	3.4*	0.9	2.3	86.7
W877	8.7	1.0	1.6	0.2	0.9	88.8	2.1	27.7*	8.8	65.0
Red Pontiac	12.1	2.0	7.2*	0.5	0.7	79.6	1.8	2.7	2.3	91.4
Russet Burbank	1.3	3.9	23.6*	0.1	0.4	71.0	2.5	3.2	8.4	87.3

1/Percent normal tubers showing no defects (some individuals had more than one type of defect).

*Possible weakness of cultivar or clone.

North Central Regional Trial Table 8. Chip Color - 1991.

Cultivar or Selection	Man. ²	Ont. ²	Alb. ²	IN ¹	IA	MI ²	MN	NE ²	NJ	ND ²	OH ¹	SD	WI ¹
Early to Medium Early													
Norland	27.5	49.4	27.0	5.0	ND	43.7	ND	45.8	ND	37.0	2.0	ND	8.0
Norchip	37.5	61.5	42.0	1.5	ND	46.0	ND	61.0	ND	48.0	1.0	ND	6.5
Norgold Russet	26.0	42.3	15.0	4.0	ND	35.5	ND	43.7	ND	22.0	3.0	ND	8.0
Medium Late to Late													
MN12567	38.5	60.9	31.0	3.0	ND	46.9	ND	54.4	ND	44.0	2.0	ND	6.0
MN12966	33.0	64.4	29.0	3.0	ND	38.1	ND	43.0	ND	42.0	2.0	ND	9.0
MN13035	25.0	44.5	17.0	3.0	ND	30.7	ND	29.8	ND	32.0	3.0	ND	8.0
MS401-1Y	51.5	67.6	46.0	3.9	ND	53.1	ND	54.0	ND	50.0	1.0	ND	5.0
MS402-8	32.3	62.3	28.0	--3/	ND	44.1	ND	48.2	ND	42.0	1.0	ND	7.0
ND1871-3R	24.0	58.9	20.0	4.0	ND	38.1	ND	30.0	ND	41.0	1.0	ND	9.0
ND1538-1Russ	36.8	44.4	26.0	4.5	ND	40.8	ND	50.5	ND	37.0	2.0	ND	8.0
LA12-59	36.3	55.6	31.0	3.0	ND	46.3	ND	53.6	ND	39.0	1.0	ND	8.0
Wisc. 856	34.0	64.1	39.0	3.0	ND	43.5	ND	60.1	ND	47.0	1.0	ND	5.0
Wisc. 870	48.8	66.1	53.0	2.0	ND	46.5	ND	60.0	ND	51.0	1.0	ND	4.0
Wisc. 877	46.3	65.4	59.0	1.5	ND	45.2	ND	53.2	ND	47.0	1.0	ND	3.5
Red Pontiac	19.3	27.7	15.0	5.0	ND	41.9	ND	25.5	ND	23.0	3.0	ND	9.0
Russet Burbank	28.8	52.0	32.0	4.0	ND	42.1	ND	54.0	ND	34.0	ND	ND	7.0
Average	34.1	55.4	31.9	3.3	ND	42.7	ND	48.0	ND	40.0	1.7	ND	6.9

1/PCI Color Chart (1 = lightest; 10 = darkest)

2/Agtron (Highest number lightest)

3/Very poor stand

ND - No data reported.

North Central Regional Trial Table 9. Early Blight^{1/} - 1991.

Cultivar or Selection	Man.	Ont.	Alb.	IN	IA	MI	MN	NE	NJ	MD	OH	SD	WI	Ave.
Early to Medium Early														
Norland	NA	NA	NA	NA	NA	NA	NA	1	NA	1.8	NA	NA	NA	1.4
Norchip	"	"	"	"	"	"	"	5	"	3.5	"	"	"	4.3
Norgold Russet	"	"	"	"	"	"	"	3	"	4.0	"	"	"	3.5
Medium Late to Late														
MN12567	"	"	"	"	"	"	"	2	"	4.5	"	"	"	3.3
MN12966	"	"	"	"	"	"	"	2	"	3.0	"	"	"	2.5
MN13035	"	"	"	"	"	"	"	5	"	3.3	"	"	"	4.2
MS401-1Y	"	"	"	"	"	"	"	3	"	1.3	"	"	"	2.2
MS402-8	"	"	"	"	"	"	"	1	"	2.3	"	"	"	1.7
ND1871-3R	"	"	"	"	"	"	"	5	"	4.5	"	"	"	4.8
ND1538-1Russ	"	"	"	"	"	"	"	2	"	3.3	"	"	"	2.7
LA12-59	"	"	"	"	"	"	"	5	"	2.5	"	"	"	3.8
Wisc. 856	"	"	"	"	"	"	"	5	"	4.8	"	"	"	4.9
Wisc. 870	"	"	"	"	"	"	"	4	"	3.8	"	"	"	3.9
Wisc. 877	"	"	"	"	"	"	"	4	"	3.5	"	"	"	3.8
Red Pontiac	"	"	"	"	"	"	"	5	"	3.5	"	"	"	4.3
Russet Burbank	"	"	"	"	"	"	"	5	"	5.0	"	"	"	5.0
Average								3.6		3.4				

1/ 1 = Severe early blight.

2 = No early blight.

North Central Regional Trial Table 10. General Merit Ratings - 1991.^{1/}

Cultivar or Selection	Man.	Ont.	Alb.	IN	IA	MI	MN	NE	NJ	ND	OH	SD	WI	Total Points
Early to Medium Early														
Norland					3			3						6
Norchip				2	2							3		7
Norgold Russet														0
Medium Late to Late														
MN12567	2		3			1	4			3		1	1	15
MN12966	4													4
MN13035							2							4
MS401-1Y	4			3	4				1		3		4	19
MS402-8														0
ND1871-3R						3	3		2	5	1		3	21
ND1538-1Russ		2	5	1		5	5	1	3	4	5	2		33
LA12-59							1	5	4		2	4		16
Wisc. 856	1	1		4	5	2		2	5	1	4		2	21
Wisc. 870	5	5	2	5		4		2		2			5	34
Wisc. 877		3												3
Red Pontiac			1					4				5		13
Russet Burbank														0

1/	Merit Ratings	
	Rating	Points
	1	5
	2	4
	3	3
	4	2
	5	1
	1.	W870 - 34
	2.	ND1538-1Russ - 33
	3.	ND1871-3R - 21 (Tie)
	3.	Wisc. 856 - 21 (Tie)
	4.	MS401-1Y - 19
	5.	LA12-59 - 16

WESTERN REGIONAL POTATO VARIETY TRIAL - 1991

J. J. Pavek, D. L. Corsini, and Cooperators^{1/}

Uniform Potato Yield Trial

The 1991 trial was grown at twelve locations for yield and two for disease data. Twenty entries, 15 experimental, two standard checks, two early checks and one red check, were grown. Three locations grew entries for both early and late harvest. The trial locations, dates of planting, vine killing, and harvest, and days from planting to harvest were as follows:

State	Location	Planting Date	Vine Kill Date	Harvest Date	Days to Harvest
California	Kern Co.	2/13	-	6/18	125
"	Tulelake	5/14	-	9/23	132
Colorado	San Luis Vly	5/16	9/6	9/19	127
Idaho	Aberdeen	4/30	9/8	9/17	140
"	Kimberly-Early	4/24	8/13	8/19	117
"	Kimberly-Late	4/30	-	10/8	161
New Mexico	Clovis	3/26	7/26	7/30	126
"	Farmington	4/22	-	10/3	164
Oregon	Hermiston-Early	4/2	7/31	8/20	136
"	Hermiston-Late	4/16	9/19	10/1	168
"	Klamath Fls	5/16	9/6	9/25	132
"	Malheur	4/19	10/2	10/8	172
Texas	Springlake	3/28	8/13	8/26	151
Washington	Othello - Early	4/4	7/25	7/30	117
"	Othello - Late	4/23	9/16	9/18	167
"	Prosser (Disease Data Only)				

Cultural practices and the use of fertilizer, herbicides, pesticides, and vine killing varied according to local conditions. Trial plots at all locations were irrigated on a regular schedule throughout the entire growing season according to plant needs. Most locations had normal temperatures throughout the growing season.

Data on vines, tubers, yield, internal quality, disease reactions, merit scores, and disposition are presented in Western Tables 1 through 7. After three years in the trial, two dual purpose russets, AC7869-17 and A082611-7, continued to show promise and will now undergo large scale increase and testing by growers and industry, and two other russets, A74212-1L and AC81198-11, will be increased and marketed fresh. As shown in Western Table 7 four russets are being dropped while the remaining seven selections will continue in the trial in 1992.

^{1/}California, R. Voss, K. Brittan; Colorado, D. Holm; Idaho, S. Love, G. Kleinkopf; New Mexico, N. Christenson, E.J. Gregory; Oregon, A. Mosley, D. Hane, K. Rykboost, C. Stanger, S. James; Texas, D. Smallwood, J. C. Miller; Washington, R. Thornton, M. Martin, L. Mikitzel, C. Brown.

Western Table 1. 1991 Seed source, stand, tuber and vine characteristics, and foliar and tuber diseases.^{1/}

Entry	Seed Source	Stand (11 loc)	TUBERS		Vine		Vert.	E. Blight		Scab	Leaf- roll
			Shape	Skin	Size	Mat		Fol	Tuber		
A74212-1L	OR	95	L	Rus	L	ML	MR	S	--	MS/R	--
A81473-2	ID	89	O	Rus	L	L	R	R	MS	R	R
A82119-3	ID	93	O	Rus	ML	L	MR	MR	MS	R	R
AC7869-17	CO	95	O	Rus	ML	ML	MR/S	S	MS	R	R
AC81198-11	CO	90	O	Rus	ML	ML	MR	MS	R	R	R
A082283-1	OR	88	O	Rus	ML	ML	MR	MS	--	S	--
A082611-7	OR	95	L	Rus	ML	M	MR	MS	MS	R	R
A083037-10	OR	89	O	Rus	M	M	MS	MS	--	R	--
ATX6-84378-1RU	CO	90	O	Rus	M	ME	S	S	--	R/V/S	--
C081082-1	CO	62	L	Rus	M	M	VS	VS	MS	MS	R
C082142-4	CO	92	O	Rus	M	ML	MR/MS	S	S	S	MS
C0083008-1	OR	92	L	Rus	M	ML	MR/MS	MS	--	R/S	--
ND671-4Rus	WA	91	O	Rus	S	E	S	VS	MS	R	R
ND1538-1Rus	WA	96	L	Rus	MS	ME	MS	S	R	R	R
Lemhi Russet	OR	94	L	Rus	ML	ML	MS	S	R	R	MS
Russet Burbank	OR	96	L	Rus	ML	ML	MS	MS	MS	R	S
Russet Norkotah	OR	95	L	Rus	S	E	VS	VS	R	R	R
Shepody	OR	94	L	Wht	ML	M	MS	S	R	S	MR
A82705-1R	ID	82	R	Red	M	M	R	S/M	R--	MR/MS	--
Red LaSoda	ID	94	R	Red	ML	ML	MS	--	MS	S	S

1/ Shape: O = oblong, L = long, R = round; Vine size: S = small, M = medium, MS = medium small, ML = medium large, Lrg = large; Mat = maturity: E = early, M = medium, L = late, ML = medium late, ME = medium early, ML = medium late; Disease reaction: R = resistant, S = susceptible, MR = moderately resistant, MS = moderately susceptible, VS = very susceptible; if two different reactions are shown, the first is for Prosser, the second for Aberdeen; Vert. = Verticillium, NN = net necrosis.

Western Table 2. 1991 Total tuber yield, cwt/acre. Full season and early harvest, early harvest in parentheses.

Entry	Calif		Colo		Idaho		NMex		Oregon		Texas		Wash		Overall
	Krn	Tul	SLV	Ab	Kim	Clv	Frm	Hrm	Klm	Mal	Spr	Oth			Mean
A74212-1L	(311)	591	396	483	678 (313)	355	429	885 (443)	639	588	421	413 (318)	534 (346)		
A81473-2	(322)	377	389	415	465 (214)	177	263	679 (366)	469	427	254	430 (243)	395 (286)		
A82119-3	(359)	370	392	392	498 (304)	167	258	713 (430)	453	513	269	465 (308)	408 (350)		
AC7869-17	(266)	404	390	389	483 (304)	281	269	700 (447)	381	503	327	489 (386)	420 (351)		
AC81198-11	(359)	438	425	423	584 (317)	267	315	645 (448)	436	424	348	596 (358)	446 (371)		
A082283-1	(374)	432	412	397	591 (255)	305	301	828 (532)	546	474	247	552 (282)	462 (361)		
A082611-7	(260)	431	426	428	517 (310)	454	362	770 (489)	398	519	308	575 (382)	472 (360)		
A083037-10	(242)	504	457	530	576 (322)	260	292	732 (474)	618	467	294	488 (363)	474 (350)		
ATX6-84378-1RU	---	404	412	418	522 (287)	319	240	807 (527)	499	463	269	563 (362)	447 (392)		
C081082-1	(267)	83	269	---	---	216	96	331 (248)	186	332	150	481 (252)	238 (216)		
C082142-4	(367)	304	354	345	359 (217)	265	249	525 (482)	444	375	242	432 (213)	354 (320)		
C0083008-1	(312)	455	334	428	487 (282)	267	303	697 (451)	416	536	237	507 (322)	424 (342)		
ND671-4Rus	(199)	---	354	346	347 (272)	218	83	416 (320)	323	500	248	579 (466)	341 (314)		
ND1538-1Rus	(267)	---	390	352	429 (323)	263	164	596 (458)	384	475	279	616 (427)	395 (369)		
Lemhi Russet	(383)	505	387	418	572 (248)	338	322	874 (458)	395	485	344	435 (284)	461 (368)		
Russet Burbank	(349)	462	429	432	598 (342)	286	291	709 (537)	467	551	287	586 (384)	463 (403)		
Russet Norkotah	(267)	428	269	---	---	370	97	---	(253)	363	290	---	325 (313)		
Shepody	---	320	400	---	---	250	304	---	(510)	194	288	---	311 (333)		
A82705-1R	(349)	---	424	---	---	330	364	---	(398)	599	299	---	403 (370)		
Red LaSoda	(383)	473	456	---	---	321	388	---	(---	413	419	---	412 (390)		
Location Means	(313)	411	388	413	514 (281)	285	270	682 (435)	431	473	291	513 (341)	416 (343)		

Western Table 3. 1991 U.S. No. 1's, percent of total yield for locations; overall mean, percent and cwt/acre; early harvest in parentheses.

Entry	Calif		Colo		Idaho		NMex		Oregon		Texas		Wash		Mean	
	Krn	Tul	SLV	Ab	Kim	Clv ^{1/}	Frm	Hrm	Klm	Mal	Spr	Oth	% cwt/A			
A74212-1L	(98)	97	68	90	84(54)	60	91	66(85)	88	84	77	84(86)	81	433(281)		
A81473-2	(78)	97	84	88	88(54)	52	82	86(86)	89	87	55	86(76)	84	332(216)		
A82119-3	(96)	92	81	83	80(56)	28	70	78(86)	81	89	40	93(84)	79	321(287)		
AC7869-17	(97)	97	87	81	86(70)	53	90	66(89)	80	83	63	74(89)	78	328(303)		
AC81198-11	(98)	96	75	78	78(49)	42	87	84(77)	69	79	61	83(81)	77	345(286)		
A082283-1	(96)	96	87	82	79(36)	64	87	84(82)	67	83	51	81(72)	80	368(272)		
A082611-7	(88)	89	79	84	77(53)	54	83	68(79)	69	85	59	81(80)	75	355(271)		
A083037-10	(98)	98	92	84	81(45)	57	93	83(81)	89	88	56	83(90)	84	399(273)		
ATX6-84378-1RU	(--)	98	75	87	93(80)	76	91	91(82)	83	84	71	92(89)	87	387(328)		
C081082-1	(94)	90	81	--	--(66)	38	70	82(81)	81	87	49	77(76)	74	177(177)		
C082142-4	(98)	96	93	85	85(59)	32	80	76(77)	85	87	57	79(69)	79	280(253)		
C0083008-1	(99)	94	85	90	91(79)	61	86	87(85)	87	88	61	93(91)	86	366(302)		
ND671-4Rus	(88)	--	72	91	48(36)	25	60	80(71)	66	87	41	81(81)	67	229(220)		
ND1538-1Rus	(97)	--	85	68	62(52)	41	81	51(77)	64	82	55	64(84)	65	256(284)		
Lemhi Russet	(95)	97	73	78	71(49)	67	90	77(81)	86	85	58	86(82)	79	366(285)		
Russet Burbank	(97)	90	59	63	43(50)	33	103	42(70)	73	72	53	77(73)	63	394(292)		
Russet Norkotah	(93)	92	83	--	--(72)	65	77	--(74)	74	88	70	--(89)	79	257(257)		
Shepody	(--)	95	87	--	--(58)	36	92	--(82)	68	83	71	--(80)	79	244(260)		
A82705-1R	(70)	--	86	--	--(56)	54	95	--(78)	90	--	48	--(87)	78	314(271)		
Red LaSoda	(98)	98	80	--	--(74)	55	94	--(--)	81	--	74	--(88)	81	335(343)		
Location Means	(93)	95	80	81	77(57)	51	88	75(80)	79	84	60	82(85)	78	325(270)		

1/ Clovis, NM: U.S. NO. 1's, >6 oz.

Western Table 4. 1991 U.S. No. 1's over 12 oz, percent of total yield for locations; overall mean, percent and cwt/acre; early harvest in parentheses.

Entry	Calif		Colo	Idaho		NMex		Oregon			Texas		Wash	Mean	
	Krn	Tu1	SLV	Ab	Kim	Clv	Frm ^{1/}	Hrm	Klm	Mal	Spr	Oth	%	cwt/A	
A74212-1L	(23)	52	21	21	22 (1)	10	22	44(36)	43	16	16	37(15)	30	160(70)	
A81473-2	(1)	31	22	30	21 (0)	5	5	36(16)	29	11	7	49 (5)	25	100(19)	
A82119-3	(15)	14	35	29	13 (1)	0	7	24(15)	12	10	0	35 (9)	18	75(37)	
AC7869-17	(36)	13	39	42	23 (4)	6	19	43(32)	16	20	4	35(26)	26	108(88)	
AC81198-11	(16)	16	39	27	24 (1)	3	13	40(29)	10	18	5	34(10)	23	103(56)	
A082283-1	(17)	28	19	25	15 (0)	17	11	50(27)	14	10	3	28 (7)	23	108(56)	
A082611-7	(0)	11	30	35	10 (1)	9	1	20(16)	4	7	4	17 (5)	14	67(26)	
A083037-10	(7)	24	44	28	13 (0)	5	9	37(22)	27	7	3	27(16)	23	108(45)	
ATX6-84378-1RU	(--)	55	60	44	46 (6)	40	18	75(62)	49	48	12	70(59)	52	234(186)	
C081082-1	(15)	16	21	--	-- (8)	0	2	17(12)	6	27	0	26(38)	16	39(43)	
C082142-4	(27)	28	38	23	10 (1)	5	4	34(21)	28	9	2	20 (1)	20	71(51)	
C0083008-1	(37)	16	33	39	15 (4)	9	4	36(23)	24	20	3	29(11)	23	97(67)	
ND671-4Rus	(16)	--	14	4	2 (0)	0	4	9 (1)	1	3	0	13 (9)	6	20(19)	
ND1538-1Rus	(9)	--	25	6	4 (0)	8	2	11(12)	5	8	6	17(25)	10	40(47)	
Lemhi Russet	(3)	20	20	17	5 (0)	14	9	46(32)	16	9	4	25(11)	19	90(48)	
Russet Burbank	(2)	16	15	5	3 (0)	1	0	16(14)	7	7	0	23 (2)	10	45(22)	
Russet Norkotah	(7)	16	22	--	-- (4)	16	3	-- (0)	7	3	12	--(12)	12	38(20)	
Shepody	(--)	35	52	--	-- (1)	8	16	--(43)	4	13	5	--(26)	21	67(104)	
A82705-1R	(10)	--	20	--	-- (1)	8	26	--(15)	22	--	1	--(22)	17	67(46)	
Red LaSoda	(9)	24	30	--	-- (0)	9	45	--(--)	10	--	6	--(33)	21	87(49)	
Location Means (14)	25		30	25	15 (1)	10	13	36(24)	19	13	5	30 (17)	22	89 (53)	

^{1/} U.S. No. 1's over 3".

Western Table 5. 1991 Specific gravity of tubers; early harvest in parentheses.

Entry	Calif		Colo	Idaho		NMex		Oregon		Texas		Wash		Overall
	Krn	Tu1	SLV	Ab	Kim	Clv	Frm	Hrm	Klm	Mal	Spr	Oth	Mean	
A74212-1L	1.089	1.081	1.098	1.083	1.072(66)	--	1.075	1.071 (64)	1.079	1.084	1.053	1.079(62)	1.078 (70)	
A81473-2	96	79	92	85	83(74)	--	79	79 (78)	86	95	62	85(74)	83 (81)	
A82119-3	94	84	95	85	91(78)	--	82	77 (72)	83	94	64	85(71)	84 (79)	
AC7869-17	92	84	92	84	82(71)	--	86	73 (70)	82	88	60	73(66)	80 (75)	
AC81198-11	85	84	85	81	89(77)	--	83	75 (70)	82	85	64	83(68)	81 (75)	
A082283-1	93	84	91	84	93(76)	--	85	83 (78)	84	94	64	92(74)	85 (80)	
A082611-7	96	90	95	86	89(79)	--	93	83 (77)	89	88	68	85(74)	87 (82)	
A083037-10	90	77	90	80	85(73)	--	79	72 (69)	80	81	52	81(71)	78 (76)	
ATX6-84378-1RU	--	78	91	75	83(72)	--	81	66 (70)	76	80	63	74(63)	77 (68)	
C081082-1	89	80	77	--	--(72)	--	79	66 (61)	72	72	56	73(72)	72 (74)	
C082142-4	94	84	92	82	82(73)	--	87	72 (72)	81	90	64	78(69)	81 (77)	
C0083008-1	97	85	98	85	91(83)	--	87	83 (78)	89	99	66	94(79)	88 (84)	
ND671-4Rus	87	--	72	70	75(74)	--	--	65 (63)	66	86	59	67(67)	70 (73)	
ND1538-1Rus	90	--	79	76	80(82)	--	85	60 (64)	71	97	62	66(70)	74 (77)	
Lemhi Russet	95	91	94	89	98(84)	--	88	84 (76)	84	105	69	82(73)	88 (82)	
Russet Burbank	97	74	88	81	83(74)	--	82	74 (74)	84	78	75	82(73)	80 (80)	
Russet Norkotah	89	81	73	--	--(84)	--	78	-- (62)	72	82	55	--(73)	74 (77)	
Shepody	--	76	89	--	--(68)	--	90	-- (68)	75	82	73	--(69)	81 (68)	
A82705-1R	84	--	81	--	--(62)	--	82	-- (57)	69	--	60	--(55)	73 (65)	
Red LaSoda	86	73	76	--	--(67)	--	77	-- (--)	66	--	57	--(65)	71 (73)	
Location Means	1.091	1.081	1.087	1.082	1.085(74)	--	1.083	1.074 (70)	1.079	1.087	1.062	1.080(69)	1.080 (76)	

Western Table 6. 1991 External and internal defects, french fry color, sugar ends, dextrose, and vitamin C.

U.S. No.2										
Entry	& Culls >4 oz %1/	Common SCAB ^{2/} (2 loc)	Shatter bruise (6 loc) ^{3/}	Hollow heart %4/	Black- spot (4 loc) ^{5/}	French Fry Color ^{6/}	Sugar Ends %7/	Dextrose YSI % FWB ^{8/}	Vit.C Mg/100g FWB ^{8/}	
A74212-1L	12	MS/R	4.6	3	1.0	2.9	37	---	---	
A81473-2	7	R	3.5	8	1.4	1.1	8	0.20	19.3	
A82119-3	11	R	4.0	7	1.5	1.0	12	0.23	17.2	
AC7869-17	14	R	3.7	3	1.5	1.0	16	0.33	17.6	
AC81198-11	11	R	4.0	5	1.5	2.9	41	0.80	18.1	
A082283-1	10	S	3.5	13	3.0	0.7	4	0.21	25.2	
A082611-7	14	R	3.8	1	1.8	1.1	5	0.32	21.9	
A083037-10	8	R	3.8	4	1.8	1.3	8	0.32	24.6	
ATX6-84378-1RU	9	R/VS	3.5	24	2.0	1.5	9	0.40	17.5	
C081082-1	16	MS	4.1	5	1.0	3.8	30	---	---	
C082142-4	11	S	4.2	11	1.2	2.9	27	0.90	20.9	
C0083008-1	7	R/S	3.9	5	1.2	0.6	5	0.17	21.7	
ND671-4Rus	11	R	3.4	3	2.0	1.7	21	0.56	20.6	
ND1538-1Rus	18	R	4.0	1	1.4	1.8	14	0.51	26.1	
Lemhi Russet	10	R	4.0	12	3.0	1.1	7	0.19	19.0	
Russet Burbank	24	R	4.5	10	1.8	1.3	27	0.29	15.7	
Russet Norkotah	13	R	4.0	3	0.8	2.0	6	---	---	
Shepody	23	S	4.0	7	1.3	3.0	19	---	---	
A82705-1R	14	MR/MS	3.0	0	1.3	4.0	49	---	---	
Red LaSoda	16	S	3.3	9	1.0	3.0	0	---	---	
Means	12		4.4	7	1.6	1.7	17	0.39	20.4	

1/ Frm omitted, Clv >6oz.

2/ Aberdeen and Prosser: R=resistant, S=susceptible, MS=moderately susceptible, R/S=resistant (Aberdeen)/susceptible(Prosser).

3/ 5.0 (none) to 1.0 (severe); 3 to 5 locations.

4/ Mean of 11 locations including Early Harvest, >12 oz. tubers; includes brown center.

5/ Mean of 2 locations (AB, Kim), 1.0 (lightest) to 5.0 (darkest).

6/ Mean of 5 locations (SLV, AB, Kim, Hrm, Klrm), out of 45 F storage, <1.0 (lightest) to 4.0 (darkest).

7/ Mean of 4 locations (Ab, Kim, Hrm, Mal).

8/ Aberdeen tubers only, sampled on Oct 22.

Western Table 7. 1991 Merit scores, processing and fresh market, and disposition.

Entry	Merit Score: Processing ^{1/}				Merit Score: Fresh Market ^{1/}						Means	Disposition
	Colo	ID	Ore	Means	Calif	Colo	ID	Ore	Tex			
	SLV	2/	Hrm		Krn	SLV	2/	HRM	Spr			
A74212-1L	1.0	2.0	1.0	1.3	4.3	2.0	3.0	5.0	3.0	3.6	RTC	
A81473-2	5.0	4.0	3.0	4.0	3.8	3.0	4.0	2.0	2.9	3.4	CONT	
A82119-3	5.0	3.0	4.0	4.0	3.8	3.0	3.0	4.0	2.6	3.6	"	
AC7869-17	5.0	3.0	2.0	3.3	4.0	4.0	3.0	3.0	2.9	3.0	RTC	
AC81198-11	1.0	2.0	1.0	1.3	3.5	3.0	3.0	1.0	2.9	2.6	RTC	
A082283-1	3.0	4.0	4.0	3.7	4.0	2.0	3.0	4.0	2.6	3.2	DROP	
A082611-7	4.0	4.0	5.0	4.3	3.8	4.0	4.0	3.0	2.8	3.3	RTC	
A083037-10	5.0	3.0	4.0	4.0	4	5.0	4.0	4.0	2.8	3.8	CONT	
ATX6-84378-1Ru	3.0	2.0	3.0	2.7	--	2.0	4.0	3.0	3.4	3.1	"	
C081082-1	1.0	--	1.0	1.0	4.3	1.0	--	3.0	2.7	3.1	DROP	
C082142-4	1.0	2.0	1.0	1.3	4.0	4.0	2.0	2.0	2.9	2.8	CONT	
C0083008-1	4.0	5.0	5.0	4.7	3.8	2.0	5.0	5.0	3.0	3.9	"	
ND671-4Russ	2.0	2.0	1.0	1.7	3.3	1.0	4.0	1.0	2.8	2.4	DROP	
ND1538-1Russ	2.0	3.0	2.0	2.3	4.3	4.0	3.0	4.0	2.8	3.4	"	
Lemhi Russet	3.0	4.0	5.0	4.0	4.3	1.0	4.0	2.0	3.2	3.3	CHECK	
Russet Burbank	3.0	3.0	2.0	2.7	3.0	2.0	3.0	1.0	2.1	2.2	"	
Russet Norkotah	2.0	--	--	2.0	4.8	1.0	--	2.0	3.4	3.0	"	
Shepody	2.0	--	--	2.0	--	4.0	--	3.0	3.0	3.3	"	
A82705-1R	1.0	--	--	1.0	4.0	3.0	--	2.0	3.1	3.0	CONT	
Red LaSoda	1.0	--	--	1.0	3.3	5.0	--	--	3.3	3.7	CHECK	
Location Means	2.7	3.1	2.8	2.8	3.9	2.8	3.5	2.8	2.9	3.6		

1/ 1.0 (poorest) to 5.0 (best).

2/ Composite scores for Ab & Kim

3/ RTC = regional testing completed (3 yrs), CONT = continue in trial, DROP = drop from trial.

COLORADO

D. G. Holm

Breeding Program Thirty-two parental clones were intercrossed in 1991. Seeds from 64 combinations were obtained. Sixty seedling families were grown in the greenhouse producing 9,478 tubers for initial field selection in 1992. Surplus tubers will be distributed to Idaho, Oregon, and Texas.

Seedling tubers were obtained from Dr. J. J. Pavsek, USDA-ARS, Aberdeen, Idaho; Dr. J. Creighton Miller, Texas A&M, Lubbock, Texas; Dr. Dermot Lynch, Agriculture Canada, Lethbridge, Alberta; Dr. Robert Johansen, North Dakota State University, Fargo, North Dakota, and Dr. Kathleen Haynes, USDA-ARS, Beltsville, Maryland.

Selection Program A total of 80,300 first-year seedlings were planted, with 884 being selected for further observation. Another 1,032 clones were in various stages of preliminary and intermediate testing. Two hundred thirty-six of these clones were saved for further evaluation. Twenty-three advanced selections (16 russets and 7 whites) were saved and will be increased. Another 143 clones were saved for breeding and other experimental purposes.

Advanced Yield Trial. Twenty-eight clones, 22 advanced selections and six cultivars, were evaluated in the advanced yield trial. Results on yield, grade, and other characteristics are summarized in Table 1.

Russet selections that had acceptable yield and grade and will be released to growers in the next two years pending results of continued testing are AC75430-1, AC83064-1, AC83064-6, AC83068-1 (red-eyed russet), and AC83172-1. AC75430-1 will be evaluated in the Western Regional Trials in 1992. Selections AC75430-1, AC83064-6, and AC83172-1 have processing potential. C080011-5 will be named in late 1992 (refer to Cultivar Releases section).

Western Regional Trial. Russet selections entered by Colorado in the Western Regional Trial were AC78069-17, AC81198-11, C081082-1, and C082142-4. C082142-4 will be entered again in 1992. C081082-1 was withdrawn from the trial but will be tested locally. AC78069-17 was graduated from the trial after three years of testing and is undergoing commercial evaluation. Results of this trial are presented in the Western Regional Variety Trial report elsewhere in this publication.

Western Regional and Advanced Chipping Trial. Thirteen selections and four cultivars were evaluated in this combined trial in 1992. Results are presented in Tables 2 and 3. Colorado entries in the Western Regional Chipping Trial were AC83306-1 and C084111-6. Two years of regional results indicate that AC83306-1 has commercial

chipping potential and will be released for grower trials in 1993. AC80545-1 will be named in early 1992 (see Cultivar Releases section).

Several selections had acceptable yield, grade, and chip color. Several selections also showed potential to recondition after 40F storage.

Other Chipping Studies. Forty-one clones, 38 selections and 3 cultivars, were tested for chipping potential after various storage regimes. This information is presented in Table 4.

None of the clones produced acceptable chips after 7 weeks of 40F storage. However, 14 of the selections produced acceptable chips with reconditioning after storage at 40F.

Seventeen selections were chipped by Borden, Inc. Results are given in Table 5. Eleven selections produced acceptable chips on both evaluation dates.

Grower Tests. Grower evaluations were conducted on four russets (AC78069-17, AC81198-11, C080011-5, and C081082-1) and one chipper (AC80545-1). Selection AC81198-11 was discarded from further testing. Testing will continue on AC78069-17, AC80545-1, C080011-5, and C081082-1 during 1992.

Selections to be released for initial grower evaluation in 1992 are AC75430-1 and C082142-4. Both of these selections are russets. AC75430-1 is a dual purpose potato with fresh market and processing qualities. C082142-4 is a fresh market selection.

Data on these selections and recently named and standard cultivars are summarized in Table 6.

Cultivar Releases. AC80545-1 was selected in Colorado and will be released in early 1992 jointly by the Colorado and Idaho Agricultural Experiment Stations and the USDA-ARS. The primary use of this round-white selection is for chipping. It has been evaluated by growers for four years. It has a high yield potential, high specific gravity, and a good percent of US #1 tubers. Tubers are moderately resistant to blackspot bruising and have a long dormancy. Commercial tests by chippers indicate excellent chipping quality.

C080011-5 will be released by the Colorado Agricultural Experiment Station in late 1992 after another season of seed increase and commercial testing as a high yielding, medium-early maturing, fresh market potato. This russet selection has been evaluated by growers for three years. Tubers tend to be flat (similar to Centennial Russet) and have a low specific gravity. Uneven plant emergence has been observed and tubers are susceptible to growth cracks. Tubers are resistant to blackspot bruising.

Russet Norkotah Selection Studies. Forty clonal selections of Russet Norkotah were selected from two tuber-united certified seed lots in 1990. Another 10 selections were made from a seed lot at the SLV Research Center in 1991. Nine of the initial 40 selections appear to have increased vine vigor. Yield trials will be initiated in 1993.

Colorado Table 1. Yield, grade, stand, vine maturity, specific gravity, tuber shape and skin type for advanced yield trial clones - 1991.

Clone	Yield (Cwt/A)					% Stand	Vine Maturity ¹	Specific Gravity	Tuber Shape & Skin Type ²
	Total	US #1			<4 oz				
		Total	%	>10 oz					
AC75430-1	362	291	80.3	113	54	98	3.5	1.101	Ob, R
AC82052-1	386	340	87.8	102	43	98	3.0	1.093	Ob, R
AC83044-1	306	206	67.3	16	40	99	3.0	1.089	Ob, R
AC83044-2	346	246	70.6	33	100	97	1.2	1.079	Ob, R
AC83064-1	422	372	88.5	175	42	99	3.2	1.081	L, R
AC83064-6	373	333	89.4	106	38	99	3.2	1.083	L, R
AC83068-1	473	383	81.0	82	76	99	3.5	1.092	L, R
AC83172-1	368	294	79.4	79	71	100	3.0	1.104	L, R
AC84028-4	324	247	76.1	25	76	96	2.0	1.079	L, R
AC84069-3	357	257	71.8	62	95	96	2.0	1.094	L, R
AC84413-4	401	266	66.2	28	129	99	2.0	1.084	Ob, R
AC84487-1	315	237	74.4	47	72	98	1.8	1.074	L, R
AC84638-1	431	360	83.6	74	57	99	2.8	1.077	R, Re
CO80011-5	363	289	79.6	66	58	97	2.0	1.075	L, R
CO83027-2	373	334	89.3	122	32	98	2.5	1.096	Ob, R
CO84074-2	404	333	82.6	55	57	97	3.5	1.082	Ob, R
CO84205-5	429	367	85.5	133	59	96	2.8	1.072	Ob, R
CO85026-4	316	281	88.7	96	31	97	3.8	1.093	L, R
CO85168-4	372	301	80.9	42	71	97	3.0	1.105	Ob, R
NDTX8-731-1R	392	363	92.6	182	20	97	2.5	1.073	R, Re
TX6-1216-1RU	310	254	81.7	54	54	98	1.0	1.076	Ob, R
TXAV657-27	439	358	81.5	87	66	98	2.8	1.099	Ob, R
Centennial Russet	289	223	76.8	16	66	97	3.0	1.081	Ob, R
Eide Russet	374	305	81.8	53	67	98	2.0	1.080	Ob, R
Russet Burbank	394	285	72.3	83	65	99	2.5	1.087	L, R
Russet Norkotah	293	240	81.6	59	49	97	1.0	1.076	L, R
Russet Nugget	369	314	84.6	94	48	97	3.5	1.110	Ob, R
Sangre	394	337	85.3	61	51	98	2.8	1.079	Ov, Re
Mean	371	300	80.8	77	60	98	2.6	1.086	-----
LSD ³ (0.05)	39	44	6.1	39	18	NS	0.7	-----	-----

¹Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

²Tuber shape: R=round; Ov=oval; Ob=oblong; L=long. Skin type: R=russet; Re=red.

³Least significant difference.

Colorado Table 2. Yield, grade, stand, vine maturity, specific gravity, tuber shape and skin type for Western Regional and advanced chipping yield trial clones - 1991.

Clone	Yield (Cwt/A)					% Stand	Vine Maturity ¹	Specific Gravity	Tuber Shape & Skin Type ²
	Total	US #1			<4 oz				
		Total	%	>10 oz					
A80559-2	433	379	87.6	97	39	97	3.2	1.121	R, W
AC80545-1	455	396	87.1	128	42	98	3.0	1.099	R, W
AC83306-1 ³	472	352	74.8	69	59	98	3.2	1.100	R, W
AC83311-2	433	331	76.5	61	90	98	3.0	1.103	R, W
AC83311-5	322	283	88.0	107	35	95	2.0	1.075	Ov, W
AC84601-1	420	359	85.4	131	46	96	2.0	1.083	R, W
AC84610-2	340	321	94.1	95	16	97	2.5	1.078	Ov, W
AC84610-5	402	315	78.3	46	77	99	2.8	1.100	Ov, W
AC85438-4	383	267	70.0	31	78	99	2.5	1.094	R, W
CO84111-6 ³	328	257	78.2	23	70	100	2.8	1.095	R, W
ND651-9	333	196	57.8	10	136	96	1.5	1.088	R, W
ND2109-7	292	194	65.9	13	96	99	1.0	1.088	Ov, W
NDA2031-2 ³	498	358	71.9	40	130	96	3.0	1.092	Ov, W
Atlantic ³	372	329	88.6	109	35	94	3.5	1.101	R, W
Gemchip ³	389	349	89.5	93	36	96	3.0	1.091	Ov, W
Norchip ³	354	269	76.1	37	58	97	2.2	1.083	Ov, W
Snowden ³	371	277	74.2	35	94	97	3.0	1.101	R, W
Mean	388	308	79.1	66	67	97	2.6	1.094	-----
LSD ⁴ (0.05)	48	48	6.3	24	17	NS	0.7	-----	-----

¹Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

²Tuber shape: R=round; Ov=oval. Skin type: W=white.

³Western Regional Chipping Trial entries.

⁴Least significant difference. NS=not significant.

Colorado Table 3. Chip color¹ and specific gravity for Western Regional and advanced chipping yield trial clones - 1991.

Clone	7 wks 40F	7 wks 50F	7 wks/40F +3 wks/60F	7 wks/50F +3 wks/60F	Specific Gravity
A80559-2	2.0	1.0	1.5	1.0	1.121
AC80545-1	4.0	1.0	3.0	1.0	1.099
AC83306-1 ²	2.5	1.5	3.5	2.0	1.100
AC83311-2	5.0	1.5	2.5	1.5	1.103
AC83311-5	5.0	2.5	3.0	1.5	1.075
AC84601-1	3.0	2.0	1.5	2.5	1.083
AC84610-2	4.0	2.0	3.0	2.0	1.078
AC84610-5	4.5	1.5	1.5	1.5	1.100
AC85438-4	3.5	1.5	1.0	1.0	1.094
CO84111-6 ²	4.0	2.0	2.0	2.5	1.095
ND651-9	4.5	2.0	2.5	1.0	1.088
ND2109-7	4.5	1.0	2.0	2.0	1.088
NDA2031-2 ²	4.0	1.0	3.0	1.5	1.092
Atlantic ²	3.0	1.5	2.0	1.5	1.101
Gemchip ²	4.0	2.0	3.0	1.5	1.091
Norchip ²	4.0	2.0	3.0	1.0	1.083
Snowden ²	4.0	2.0	1.0	1.0	1.101

¹Chip color was rated using the Snack Food Association 1-5 scale.
Ratings of ≤ 2.5 are acceptable.

²Western Regional Chipping Trial entries.

Colorado Table 4. Chip color¹ and specific gravity of San Luis Valley chipping study entries - 1991.

Clone	7 wks 40F	7 wks 50F	7 wks/40F +3 wks/60F	7 wks/50F +3 wks/60F	Specific Gravity
A80559-2	3.0	2.0	2.5	1.0	1.104
AC80545-1	4.0	1.5	3.0	1.5	1.080
AC83306-1	3.5	2.0	2.0	2.5	1.081
AC83311-2	4.5	2.0	3.5	3.0	1.097
AC83311-5	5.0	3.0	3.5	4.0	1.081
AC84375-2	5.0	4.0	4.5	3.0	1.091
AC84610-2	4.0	1.5	3.5	2.5	1.080
AC84610-5	4.5	1.5	1.5	2.5	1.101
AC85438-4	4.0	2.0	3.0	2.0	1.092
AC86444-5	4.0	1.5	3.0	2.0	1.090
AC86449-1	3.5	1.0	1.5	1.5	1.099
AC86449-2	3.0	1.0	1.0	2.0	1.086
AC87057-1	4.0	1.5	4.0	1.5	1.089
AC87057-3	5.0	3.0	4.5	3.5	1.084
AC87057-8	4.0	2.5	4.0	2.0	1.090
AC87115-2	4.5	2.0	4.5	2.5	1.086
AC87313-3	3.5	1.5	1.5	1.0	1.094
AC87341-2	4.0	2.0	2.5	1.5	1.079
AC87345-2	4.0	3.0	4.0	1.5	1.087
ATX7-85404-8	4.0	1.0	2.0	1.5	1.090
BC0894-2	3.0	1.0	2.0	2.0	1.077
BC0997-1	5.0	3.0	5.0	3.0	1.079
C084111-6	5.0	2.5	3.0	2.0	1.092
C086106-3	4.5	2.0	4.0	1.5	1.072
C086106-4	4.5	1.0	3.0	1.5	1.084
C086224-1	4.0	2.5	2.5	2.5	1.091
C087017-1	3.5	1.5	4.0	2.5	1.080
C087017-5	3.5	1.5	3.5	1.0	1.088
C087019-1	4.5	2.5	4.0	2.0	1.077
C087047-1	5.0	2.5	5.0	2.5	1.075
C087100-1	5.0	3.5	4.5	3.0	1.084
C087106-1	4.0	2.5	3.5	3.5	1.090
C087106-5	3.5	1.5	3.5	1.5	1.089
ND651-9	5.0	2.0	3.0	1.0	1.084
ND1995-1	3.0	1.0	1.5	1.0	1.093
ND2008-2	3.0	1.0	2.0	1.0	1.084
ND2109-7	4.5	1.0	3.0	1.0	1.087
NDO1496-1	4.0	1.5	2.0	1.5	1.085
Atlantic	4.0	1.5	3.0	1.5	1.101
Norchip	4.5	1.5	3.0	1.0	1.085
Snowden	4.0	1.5	2.0	1.0	1.081

¹Chip color was rated using the Snack Food Association 1-5 scale.
Ratings of ≤ 2.5 are acceptable.

Colorado Table 5. Chip color¹ and specific gravity evaluations - Borden, Inc.² - 1991.

Clone	Specific Gravity	Oct. 23 ³	Feb. 12 ³
AC80545-1	1.075	2.0	4.0
AC83306-1	1.078	4.0	3.5
AC83311-2	1.095	5.0	5.0
AC83311-5	1.081	5.0	3.5
AC84610-2	1.081	3.5	3.5
AC84610-5	1.105	2.0	2.5
AC85438-4	1.087	4.0	7.0
AC86444-5	1.089	2.0	2.5
AC86449-1	1.097	2.0	3.5
AC86449-2	1.090	4.0	2.0
ATX7-85404-8 ⁴	1.092	2.0	3.0
BC0894-2	1.078	1.0	1.0
CO84111-6	1.088	3.0	2.5
CO86106-3	1.077	4.5	3.0
CO86106-4	1.080	3.5	4.5
CO86224-1	1.093	5.0	5.0
NDO1496-1	1.089	2.0	2.0
Atlantic	1.098	2.5	3.0
Norchip	1.087	2.5	2.5

¹Chip color was rated using the PCII 1-10 scale. Ratings of 1-4 acceptable, 5 marginal.

²Data collected by Mr. Larry Anderson.

³Potatoes were harvested September 2-4 and held at approximately 55-60F prior to chipping on October 23. Tubers were then gradually cooled to 48-50F for storage.

⁴Internal purple discoloration observed.

Colorado Table 6. Comparison of advanced selections with recently named and standard cultivars for yield, grade, maturity, specific gravity, and grade defects.

Clone	Usage ¹	Loc x Years	Total Yield (Cwt/A)	% US #1	Specific Gravity	% External Defects ²	% Hollow Heart ³
Russets							
A74212-1	FM	5	399	83.9	1.083	3.3	0.0
C080011-5	FM	6	363	81.9	1.074	3.1	0.1
AC78069-17	FM/FRY	5	383	87.6	1.086	4.6	0.4
C081082-1	FM	5	336	85.0	1.076	0.6	0.8
AC75430-1	FM/FRY	4	399	85.8	1.094	2.3	1.1
C082142-4	FM	4	383	91.1	1.089	0.9	0.5
Centennial Russet	FM	18	290	77.3	1.084	1.1	0.6
Frontier Russet	FM/FRY	3	271	84.2	1.089	2.8	0.3
Norgold Russet	FM	9	321	76.2	1.078	0.4	0.8
Ranger Russet	FM/FRY	3	371	86.0	1.089	2.3	0.0
Russet Burbank	FM/FRY	19	363	63.9	1.086	10.1	1.3
Russet Norkotah	FM	7	265	80.1	1.076	2.3	0.3
Russet Nugget	FM/FRY	9	357	79.3	1.098	1.8	0.4
Chippers							
AC80545-1	CHIP	6	445	83.4	1.090	3.4	0.1
Atlantic	CHIP	5	391	86.1	1.100	1.5	3.0
Gemchip	CHIP	8	398	83.6	1.090	1.6	1.9
Norchip	CHIP	11	330	74.3	1.083	6.2	0.4

¹FM=fresh market, FRY=french fry.

²Includes defects such as growth crack, second growth, misshapen, and green.

³Based on tubers greater than 10 ounces.

FLORIDA

J. R. Shumaker, D. P. Weingartner, and Steve Molnar

Variety and Seedling Trials

Methods: Potato varieties and seedlings were tested for their adaptability and desirable horticultural characteristics at the Agricultural Research and Education Center, Hastings, Florida. Clones were grown in advanced trials (four replications) or intermediate trials (two replications). Seed was spaced 12 inches apart in 20 foot single row plots. Between row spacing was 40 inches. The crop was planted on January 31 and harvested May 20-21. Commercial cultural practices were used in all tests. Yield of tubers, their appearance and specific gravity were taken at harvest. Tuber samples were shipped to Berwick, Pennsylvania, for chip color evaluations.

Round White and Red Skin Adaptability and Processing Quality Trials (Table 4): In 1991, 58 clones were grown in replicated trials under moderately unfavorable conditions and compared to the standard chip processing cultivar, Atlantic. A number of clones combined tuber yields and other processing traits which were equal to, or better than Atlantic (WF31-4, La Belle, B9792-8B, Snowden, and CS7635-4). Of these, however, only CS7635-4 produced solids which were equal to those produced by Atlantic. These and other clones, i.e., Steuben, AF828-5 and B0179-17, which demonstrated desirable fresh market traits will be evaluated in replicated trials during 1992. Steuben (a round white), LA12-59 (a round red) and Hudson (a round white which is resistant to corky ringspot disease) will be extensively grower evaluated in 1992. The University of Florida will participate with the USDA, ARS, in the release of B9792-8B in 1992.

Florida Table 1. Results from clones selected for intermediate testing at Hastings, Fl. - 1991.

Clone 1/	Size distribution % of total US-1A 2/				Total US-1A	Grand total	Tuber appear ance 3/	Spec grav	Chip color 4/		
	1	2	3	4					5/28	5/30	6/4
Atlantic	39	46	13	1	243	279	7.3	1.062	2	4	3
B0941-43	34	44	23	0	239	254	7.5	1.056	5	5	7
B0874-12	64	35	1	0	236	258	7.5	1.062	3	3	5
B0763-15	40	44	16	0	227	264	7.0	1.057	1	1	4
B0726-18	59	36	5	0	222	247	6.0	1.059	2	3	3
B0766-3	25	33	41	0	219	249	7.0	1.058	1	2	3
B0884-17	69	28	3	0	213	243	7.0	1.053			
B0869-1	74	24	2	0	202	255	6.0	1.059			
B0779-10	70	28	2	0	197	225	7.0	1.061	3	4	5
B0753-9	59	35	6	0	194	228	6.0	1.055			
B0674-9	59	32	9	0	191	211	8.0	1.051	2	5	7
B0726-14	64	28	8	0	182	216	6.0	1.055			
B0925-7	75	25	0	0	182	225	5.5	1.062	3	5	6
B0717-8	48	40	11	0	179	230	5.0	1.055			
B0879-1	74	23	3	0	174	218	7.5	1.061	3	5	7
B0810-7	67	32	1	0	173	229	4.5	1.059			
B0868-3	94	6	0	0	172	201	6.0	1.051			
B0884-10	76	24	0	0	165	206	5.0	1.054			
B0723-2	41	49	9	0	151	198	4.0	1.056			
B0723-7	31	31	36	2	149	264	3.5	1.047			
B0887-5	49	41	10	0	144	173	6.0	1.058			
B0869-14	82	18	0	0	143	174	7.5	1.057			
B0761-3	86	11	3	0	142	183	8.0	1.059	2	4	5
Coastal Chip	58	33	9	0	141	178	7.0	1.054			
B0870-5	96	4	0	0	140	185	6.5	1.059			
B0764	78	21	1	0	135	170	7.0	1.050			
B0906-1	57	36	7	0	135	180	7.5	1.059	2	4	5
B0758-22	72	28	0	0	135	162	6.0	1.059			
B0866-8	74	26	0	0	134	173	8.5	1.046			
B0855-10	92	8	0	0	134	185	8.0	1.061			
B0811-13 (R)	73	20	7	0	130	186	6.0	1.061			
B0938-1	90	10	0	0	127	161	7.5	1.063			
B0851-8	83	17	0	0	124	145	7.5	1.068			
B0760-18	75	23	2	0	124	175	6.0	1.048			
B0851-7	85	15	0	0	121	151	8.0	1.059			
B0754-19	53	36	10	0	119	159	5.5	1.053			
B0930-7	56	31	13	0	118	161	6.0	1.059			
B0892-7	84	16	0	0	118	159	6.5	1.061			
B0758-28	64	33	4	0	117	162	5.0	1.071	1	1	2
B0851-16	91	9	0	0	114	193	5.5	1.052			
B0893-2	61	38	2	0	114	162	6.5	1.059			
B0918-14	83	15	2	0	113	147	6.5	1.055			
Superior	89	11	0	0	111	139	8.0	1.058			
B0865-9	97	3	0	0	108	161	7.5	1.063			

Florida table 1. continued.

Clone 1/	Size distribution % of total US-1A 2/				Total US-1A	Grand total	Tuber appear ance 3/	Spec grav	Chip color 4/		
	1	2	3	4					5/2	5/30	6/4
B0753-13	81	19	0	0	100	129	7.0	1.067	2	2	4
B0813-16	98	2	0	0	97	151	7.0	1.061			
B0761-6	73	27	0	0	96	128	7.0	1.056			
B0887-4	83	17	0	0	96	144	6.5	1.059			
B0899-5(R)	53	27	19	0	93	111	8.0	1.058			
B0943-3	100	0	0	0	91	150	7.0	1.061			
B0870-4	92	8	0	0	89	145	6.5	1.055			
B0728-5	36	59	4	0	87	138	6.5	1.063			
B0813-7	85	15	0	0	87	126	6.0	1.079			
B0848-2	82	16	2	0	84	106	4.5	1.056			
B0905-11	72	24	4	0	82	107	6.0	1.057			
B0930-13	58	37	5	0	66	134	6.5	1.051			
B0854-37	100	0	0	0	65	131	7.5	1.054			
B0870-10	100	0	0	0	64	124	7.0	1.064			
B0735-9	98	2	0	0	58	126	7.0	1.071			
B0757-17	100	0	0	0	19	34	6.5	1.045			
LSD (.02)					51	35	2.1	0.004			

1/ (R) denotes red-skin clone, otherwise white skin.

2/ Size distribution of total US-1A: 1 = 1-7/8 to 2-1/2";
2 = 2-1/2 to 3"; 3 = 3 to 3-3/4"; 4 = over 3-3/4".

3/ Tuber appearance from 10.0 = most desirable to 0.0 = completely undesirable.

4/ Chip color: 1 to 4 = acceptable; 5 = borderline use; >5 = too dark for use.

Florida Table 2. Results from clones selected for intermediate testing at Hastings, Fl. - 1991.

Clone 1/	Size distribution % of total US-1A 2/				Total US-1A	Grand total	Tuber appear ance 3/	Spec grav	Chip color 4/		
	1	2	3	4					5/29	5/31	6/4
AF1470-17	60	39	1	0	235	275	7.5	1.049			
AF875-15	52	34	14	0	219	245	6.0	1.056	3	3	3
AF1470-6	39	41	20	0	217	249	7.0	1.043			
B0564-9	28	47	26	0	203	219	7.5	1.057			
B0178-35	45	32	23	0	198	211	6.5	1.057			
B0616-1 (R)	45	33	22	0	198	224	7.0	1.051			
B0585-1	66	32	2	0	196	234	6.0	1.053			
B0179-18	40	48	12	0	192	210	7.0	1.054	3	3	5
B0583-2	43	41	16	0	191	252	6.5	1.056	3	5	4
B0176-24	34	39	27	0	190	205	7.5	1.050			
B0178-34	48	42	10	0	183	202	6.5	1.063			
AF1455-20	63	33	4	0	181	210	7.5	1.058	3	4	3
Atlantic	39	51	10	0	180	231	7.0	1.064	2	2	3
B0174-16	49	44	7	0	180	196	8.0	1.057			
AF1470-28	38	45	17	0	177	226	8.5	1.048			
AF1377-2	31	50	18	0	176	207	7.0	1.050			
B0566-5	89	11	0	0	175	222	6.5	1.058			
B0587-1	87	13	0	0	172	203	6.5	1.052			
B0583-8	78	22	0	0	171	199	8.0	1.061	2	4	6
B0233-1	83	17	0	0	169	185	7.0	1.050	3	4	6
B0587-6	60	35	5	0	167	188	6.0	1.061	3	5	6
AF1454-37	27	46	27	0	165	195	7.5	1.052			
AF1470-29	36	49	15	0	163	180	8.5	1.057	4	6	5
Coastal Chip	63	37	0	0	163	184	5.5	1.051			
B0241-8	36	57	6	0	162	186	6.5	1.055			
B0687-14	80	20	0	0	162	187	7.0	1.057			
B0717-1	85	15	0	0	160	189	6.5	1.051			
AF1467-14	58	35	8	0	153	210	7.0	1.053			
B0257-9	43	43	14	0	151	184	6.0	1.066			
B0179-6	82	18	0	0	149	181	7.0	1.064	2	3	5
B0257-12	72	22	6	0	149	174	7.5	1.057	3	4	5
B0684-5	34	43	23	0	146	169	5.0	1.047			
B0596-9	79	21	0	0	146	182	7.0	1.053			
B0209-1	20	63	16	0	145	163	6.0	1.049	2	3	4
B0257-3	73	27	0	0	143	170	7.0	1.060			
AF1455-9	65	32	3	0	143	189	7.0	1.045			
B0676-7	31	48	21	0	142	171	7.0	1.054	3	4	5
B0564-8	73	20	7	0	141	186	8.0	1.058			
B0585-5	56	37	7	0	141	173	7.5	1.052			
B0243-7	50	50	0	0	140	165	5.0	1.051			
AF1470-9	89	11	0	0	140	172	7.5	1.054	2	5	6
AF1466-59	61	39	0	0	136	170	6.5	1.043			
B0682-2	57	31	12	0	136	181	5.5	1.054			
B0635-6	78	22	0	0	134	165	7.5	1.057			

Florida table 2. continued.

Clone 1/	Size distribution % of total US-1A 2/				Total US-1A	Grand total	Tuber appear ance 3/	Spec grav	Chip color 4/		
	1	2	3	4					5/29	5/31	6/4
B0174-11	57	33	10	0	130	158	7.5	1.064	2	4	5
B0696-2	77	21	2	0	128	151	7.5	1.061	2	3	6
B0175-20	50	50	0	0	127	178	5.5	1.065	3	4	4
B0033-23 (R)	73	24	3	0	124	147	7.0	1.051			
Superior	91	9	0	0	118	145	7.5	1.062			
B0178-16	31	44	25	0	117	145	7.0	1.060	3	4	5
B0608-1	98	2	0	0	115	155	7.0	1.063			
B0684-2	85	15	0	0	102	131	4.5	1.049			
B0582-1	61	36	4	0	101	121	6.5	1.058			
AF1471-14	34	44	22	0	100	126	7.5	1.046			
B0473-6	100	0	0	0	92	128	7.5	1.059			
B0613-3	83	17	0	0	78	109	7.5	1.050			
B0610-2	86	14	0	0	75	110	7.5	1.063			
AF1470-7	62	34	3	0	73	88	7.0	1.044			
B0564-6	64	33	3	0	72	155	4.0	1.048			
B0682-6	52	34	15	0	71	141	6.5	1.054			
LSD (.03)					43	42	1.8	0.005			

1/ (R) denotes red-skin clone, otherwise white skin.

2/ Size distribution of total US-1A: 1 = 1-7/8 to 2-1/2";
2 = 2-1/2 to 3"; 3 = 3 to 3-3/4"; 4 = over 3-3/4".

3/ Tuber appearance from 10.0 = most desirable to 0.0 = completely undesirable.

4/ Chip color: 1 to 4 = acceptable; 5 = borderline use; >5 = too dark for use.

Florida Table 3. Results from clones selected for intermediate testing at Hastings, Fl. - 1991.

Clone	Size distribution % of total US-1A 1/				Total US-1A	Grand total	Tuber appear ance 2/	Spec grav	Chip color 3/		
	1	2	3	4					5/29	5/31	6/4
J84-8	44	45	11	0	195	238	7.5	1.056	3	5	6
W887	60	30	10	0	172	193	6.0	1.064			
Atlantic	34	49	17	0	161	198	7.5	1.059	1	3	3
H26-2	57	35	8	0	148	172	7.5	1.058	3	4	3
J33-7	66	32	2	0	146	184	7.5	1.051	6	6	7
J52-23	61	32	8	0	145	162	8.0	1.046			
H51-43	61	38	1	0	143	173	7.0	1.053			
H51-19	80	20	0	0	138	166	7.0	1.065			
J84-12	93	7	0	0	137	179	7.5	1.058			
AF1476-7	37	52	11	0	136	162	7.0	1.044			
AF1484-8	86	14	0	0	134	204	6.0	1.051			
K255-6	46	40	14	0	133	176	7.0	1.061	3	3	3
AF1475-16	58	39	3	0	126	165	7.0	1.057	5	6	8
AF1472-6	57	41	2	0	124	168	7.0	1.052			
J52-11	54	44	2	0	123	173	5.0	1.055			
J52-45	68	30	1	0	122	147	5.5	1.059	3	4	3
K257-1	86	14	0	0	120	167	7.0	1.066	3	4	2
H51-7	74	26	0	0	119	160	6.5	1.058			
AF1474-2	58	37	5	0	119	175	6.0	1.049			
Coastal Chip	66	34	0	0	118	163	6.0	1.054	2	3	3
AF1473-6	24	50	26	0	118	161	6.0	1.044			
AF1489-3	85	15	0	0	112	155	7.0	1.055	3	5	5
Superior	78	22	0	0	109	139	7.0	1.058	5	5	3
J84-4	73	22	5	0	107	131	7.5	1.056			
H50-80	72	28	0	0	106	151	7.5	1.065			
H51-9	55	41	4	0	104	140	7.5	1.052			
J84-16	90	10	0	0	104	147	7.0	1.066	2	3	3
W870	79	21	0	0	101	127	7.0	1.065	3	3	7
J52-16	75	25	0	0	98	115	6.5	1.055			
AF1481-2	39	54	7	0	93	169	5.5	1.047			
AF1471-15	61	39	0	0	83	123	8.0	1.050			
J52-2	84	16	0	0	81	123	7.5	1.057			
H51-34	90	10	0	0	72	86	6.5	1.059			
NDA2126-6	63	37	0	0	65	144	5.0	1.052	5	6	3
A80559-2	68	32	0	0	60	101	6.5	1.059	3	3	5
LSD (.03)					51	45	1.6	0.008			

1/ Size distribution of total US-1A: 1 = 1-7/8 to 2-1/2";

2 = 2-1/2 to 3"; 3 = 3 to 3-3/4"; 4 = over 3-3/4".

2/ Tuber appearance from 10.0 = most desirable to 0.0 = completely undesirable.

3/ Chip color: 1-4 = acceptable; 5 = borderline use; >5 = too dark for use.

Florida Table 4. Results from clones selected for advanced testing at Hastings, Fl. - 1991.

Clone 1/	Size distribution % of total US-1A 2/				Total US-1A	Grand total	Tuber appear ance 3/	Spec grav	Chip color 4/		
	1	2	3	4					5/28	5/30	6/3
WF31-4	37	55	8	0	190	208	7.0	1.057	4	3	3
Steuben	46	42	13	0	189	214	7.8	1.048	5	5	5
La Belle	67	30	3	0	187	205	5.3	1.051			
B9792-8B	52	45	3	0	185	199	6.5	1.057	3	3	3
Snowden	69	27	4	0	184	207	7.0	1.057	3	3	3
Atlantic	44	50	6	0	184	204	7.5	1.058	2	3	4
CS7635-4	67	31	2	0	178	201	6.8	1.058			
AF828-5	48	40	12	0	178	196	7.5	1.047	3	4	6
B0179-17	47	40	12	0	170	177	6.5	1.052	6	6	6
AF1424-2	25	45	30	0	169	181	7.5	1.047			
B0178-30	50	43	7	0	163	178	7.3	1.057	3	3	3
La Chipper	57	37	7	0	160	183	6.8	1.052	3	3	5
B0256-1	58	32	10	0	159	182	7.3	1.064	2	3	4
AF1060-2	50	39	11	0	156	191	7.3	1.049	2	5	7
AF875-15	56	36	8	0	143	169	6.8	1.056	4	3	3
Denali	74	26	0	0	140	155	8.0	1.057			
Norchip	68	31	1	0	139	160	5.3	1.055			
AF875-16	86	12	2	0	135	152	6.8	1.063			
Coastal Chip	70	30	0	0	132	153	5.8	1.053	3	3	4
AF756-5	77	23	1	0	131	164	5.0	1.036			
Hudson	48	38	14	0	131	159	6.5	1.048			
Oceania	76	24	0	0	130	155	8.3	1.048			
AF1433-4	64	30	6	0	129	152	7.0	1.047			
La Rouge (R)	60	31	9	0	127	171	4.8	1.046			
B9792-158	69	30	1	0	126	161	6.8	1.051	3	5	3
AF1424-7	82	18	0	0	123	140	6.5	1.061	3	3	4
B0032-40 (R)	85	14	1	0	115	145	6.5	1.051			
Somerset	91	9	0	0	113	135	7.8	1.062	2	3	3
CS7697-24	62	33	6	0	104	133	8.0	1.051			
Red La Soda	42	46	12	0	102	160	4.8	1.042			
LA12-59	70	25	5	0	98	121	7.0	1.054			
Superior	96	4	0	0	85	115	7.0	1.055	4	5	3
ND2224-5 (R)	98	2	0	0	84	116	7.8	1.051			
Ontario	87	13	0	0	54	105	4.8	1.049			
Allegany	66	29	5	0	39	52	5.8	1.054			
LSD (.01)					35	34	1.1	0.004			

1/ (R) denotes red-skin clone, otherwise white skin.

2/ Size distribution of total US-1A: 1 = 1-7/8 to 2-1/2";

2 = 2-1/2 to 3"; 3 = 3 to 3-3/4"; 4 = over 3-3/4".

3/ Tuber appearance from 10.0 = most desirable to 0.0 = completely undesirable.

4/ Chip color: 1 to 4 = acceptable; 5 = borderline use; >5 = too dark for use.

Florida, Table 5. Results from russet clones selected for intermediate testing at Hastings, Fl. - 1991.

Clone	size distribution % of total US-1A 1/			Yield (cwt/A) -----		Tuber Appear ance 2/	Specific Gravity
	1	2	3	Total US-1A	Grand Total		
B0745-6	46	39	16	123	164	6.0	1.059
Russette	64	31	5	123	162	5.5	1.053
B0905-1	41	42	17	122	157	5.5	1.050
NemaRus	48	42	11	113	138	8.0	1.046
Coastal Russet	57	41	2	111	138	7.5	1.049
B0672-9	45	43	13	110	144	6.5	1.047
ND1538-1	80	17	4	109	173	6.0	1.054
B0647-1	85	15	0	101	141	8.0	1.051
B0915-3	38	41	21	90	120	7.5	1.056
BelRus	82	15	3	80	126	8.0	1.056
AF1461-11	56	35	8	66	106	6.5	1.056
B0663-18	86	10	4	56	108	5.5	1.050

1/ Size distribution of total US-1A: 1 = 2 to 5 oz. (strippers);
2 = 5 to 7 oz; 3 = over 7 oz.

(2) Tuber appearance from 10.0 = most desirable to 0.0 = completely undesirable.

Maine

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Introduction: Forty-six potato varieties and clones were tested at Aroostook Farm, Presque Isle, Maine, as part of the NE107 Regional Project (Breeding and Evaluation of Potato Clones for the Northeast). The primary objective of this trial is to determine performance, quality, and storage characteristics of promising potato clones and new varieties in Maine.

Methods: Single-row plots, 25 feet long were hand planted on May 16 (lates, russets), May 20 (mediums), and May 22 (earlies, reds), 1991, using a randomized complete block design and six replications. Seedpieces of round-whites and reds were spaced either eight or ten inches apart, while most russets were spaced 12 inches apart. Russet Burbank seedpieces were spaced 16 inches apart. Plots were located on Caribou loam soils typical of the area. All varieties were grown following plowed down clover or timothy/clover sod on two sites with pH values of 5.2 and 5.6, respectively. The early and red trials were fertilized with 860 lbs/A of 14-14-14, banded at planting. Late, medium, and russeted varieties received 1050 lbs/A of the same fertilizer blend. Metribuzin (0.5 lbs ai/A) was applied on May 31 for broadleaved weed control. Cultural practices were similar to those used on commercial farms in the area, and varieties were grouped so that separate tests could be vinekilled and harvested based on maturity classification. Specific gravity was determined at harvest using the weight-in-air/weight-in-water method. Hollow heart ratings indicate the number of hollow tubers observed per 40 large tubers examined. Chip color evaluations were conducted on December 5 and 6, following storage at 50°F. Chips were fried at 350° F until bubbling stopped and evaluated using an Agtron M35, calibrated with the black "0" disk = 0 and the white "90" disk = 90. Chips were crushed and reported values are means from four replicates per variety. Each sample was read three times and was thoroughly mixed between readings.

Results:

General Growth and Plant Stands. Crop growth was severely limited by low rainfall from June through August 10. Reduced growth was particularly obvious on the shaley site used for the early and red varieties. Rain finally began falling on August 10 and became excessive for the month of August. Rainfall for May, June, July, and August totaled 3.23, 0.85, 0.78, and 8.53 inches, respectively. Tuber sizing was delayed by the early drought conditions. Yield and specific gravity were lower than usual for many

varieties, especially early maturing and russeted varieties. Most of the varieties emerged quickly and produced excellent stands in these studies. Serious stand problems were observed for Chaleur and NYE55-35 which had 60% stands. Gemchip, LaBelle, F82026, NYE55-44, and NY84 had stands in the 70% to 80% range. The following varieties and lines produced small plants and incomplete ground cover: Chaleur, Frontier Russet, B0257-9, and ND2224-5R.

Early Maturity Trial. Yields were very low in this trial due to low rainfall and use of a shaley, eroded site. NYE55-44 was the most productive line under these difficult growing conditions (Maine Tables 1 and 2). It produced significantly higher marketable yields than all other lines in the test, including Superior. NYE55-44 produced uniform and attractive tubers for table use. Tuber size was quite small, but NYE55-44 sized better than all lines tested, except for Superior. NYE55-44 had excellent chip colors from December storage, but specific gravity was marginal during 1991. None of the other lines produced total or marketable yields that exceeded those of Superior. Yields of Chaleur and AF845-11 were particularly poor. None of the lines tested sized particularly well for tablestock use; however, AF1333-1 showed some promise for table use and warrants further testing under better growing conditions.

Norchip, AF845-11, AF1302-1, B0257-3, and NYE55-44 produced tubers with excellent chip colors. B0257-3 was the only line with exceptional specific gravity. Despite marginal specific gravity during 1991, NYE55-44 appears to have the best potential as an early chipper. B0257-3 is not an outstanding yielder and sizes poorly, but it chips well from storage and has consistently high specific gravity.

Red-Skinned Trial. Three red-skinned varieties were compared with Norland and Chieftain standards (Maine Tables 1 and 2). Chieftain and Reddale were the highest yielding variety in these trials. Norland and ND2224-5R were low yielding. With the exception of Red Gold, all of these varieties have low specific gravities. Reddale produces very large tubers, while those of Red Gold and ND2224-5R were especially small. Tubers of Chieftain and ND2224-5R were quite attractive in these trials, while those of Norland and Reddale were fair in appearance. Reddale had a high percentage of growth cracked tubers

during 1991. ND2224-5R had a deep red skin color and small uniform tubers which were particularly striking.

Medium Maturity Trial. None of the test clones produced total yields that exceeded those of Kennebec or Atlantic; however, MaineChip, Saginaw Gold, AF875-15, F82026, and NYE55-27 yields were statistically equal to those of these high yielding standards (Maine Table 3). Atlantic, LaBelle, Saginaw Gold, AF875-15, and NYE55-27 produced the highest marketable yields in this test. Gemchip, B0257-9 and NY85 were particularly low yielding in this trial. Kennebec had a very high incidence of sunburned tubers and was the only line in this test that had serious external quality problems (Maine Table 4). Small tuber size limited the potential tablestock utilization of many of these lines. Only Kennebec, Atlantic, LaBelle, B0256-1, B0257-9, F77087 and F82026 sized well. Tuber appearances of LaBelle, F77087, F82026, NYE57-13, and NY85 were quite good.

Several promising chipping selections appeared in this trial. Acceptable chip colors were obtained from Atlantic, Gemchip, MaineChip, Saginaw Gold, AF875-15, B0257-9, F77087, NYE11-45, NYE55-27, NYE57-13, and NY85. Chip colors were poor for LaBelle, B0256-1, and F82026. Specific gravities of MaineChip, B0256-1, B0257-9, NYE55-27 and NY85 were equal to or exceeded those of Atlantic. MaineChip has been the most consistent chipping line over the past few years. Saginaw Gold has been consistently high yielding and has usually produced good quality tubers for table and chip use. Specific gravity of Saginaw Gold is marginal for chipping. AF875-15, NYE55-27, and NYE57-13 may have potential for chipping use in Maine, but these lines need additional evaluation in regional trials.

Late Maturity Trial. The most promising tablestock selections in the late maturity trial were Allegany, AF828-5, and NY84. These selections generally combine high yields, attractive tuber appearance, and acceptable tuber size (Maine Table 5 and 6). Only AK-3-79-235-81 produced significantly higher total yields than Allegany; however, tuber appearance of this line was poor. B0175-20, B0175-21, B0178-34, NYE55-35, and NY78 produced excellent chip colors in this trial; however, B0175-21, B0178-34, and NYE55-35 were low yielding. Specific gravities of B0175-20, B0175-21, B0178-34, and NYE55-35 were excellent. Considering performance during the past two years, B0175-20 is the best chipping prospect in this maturity class.

Russet-Processing Trial. All russeted lines in our test were low yielding due to the dry weather experienced during 1991 (Maine Table 5). Despite its low yields, Frontier Russet was the only line that sized well in these trials. B9922-11 sized moderately well given the poor growing conditions. Specific gravities of all test lines except ND671-4 were very high. Considering tuber size, marketable yields and appearance, Frontier Russet, Russet Norkotah, and B9922-11 were the best prospects for table use (Maine Tables 5 and 6). Only W1005Rus produced tubers with significantly lighter fry colors than Russet Burbank from storage in December. Based on fry color, tuber size and specific gravity during, B9922-11 had the best overall potential for french fry utilization in this group. W1005Rus would have ranked first if it had produced larger tubers.

Storage Evaluations. Limited data on storage and processing characteristics were collected from 49 varieties and clones grown during the 1990 growing season (Maine Tables 7 and 8). French fry quality of several selections was evaluated under simulated processing conditions (Maine Table 7). None of these clones produced french fries that were rated superior to Russet Burbank in texture. B0220-14 produced the best quality fries in this test on the basis of color, uniformity, and texture.

Chip colors from 50°F storage in February were excellent for MaineChip, Norchip, Saginaw Gold, B0172-15, B0175-20, B0257-3, B9955-46, F77087, NYE55-44, and NYE57-13 (Maine Table 8). MaineChip, B0172-15, B0257-3, B0257-9, B9955-46, NYE55-44 and NYE57-13 also produced very light chips directly from 45°F storage. Although none of the selections produced acceptable chips directly out of 38°F storage, AF845-11, AF879-3, B0172-15, B0175-20, B0178-34, B0257-3, B9792-158, B9955-46, F77087, NYE55-44, and NYE57-13 reconditioned well from 38°F storage. Only Russet Burbank had after-cooking darkening scores that were considerably poorer than Katahdin. Washed appearance ratings were particularly outstanding for Allegany, Chieftain, Norland, Russet Norkotah, AF828-5, F82026, NYE55-44, NYE57-13, and NY84. Tuber dormancy was exceptionally short for BelRus, Red Gold, AF875-15, AF1060-2, B0172-15, B0175-20, B0178-34, B0246-7, B0256-1, NY78, and NY84. Dormancy of Allegany, Kennebec, LaRouge, Saginaw Gold, NYE55-44, and NYE57-13 was quite long. Selections with very low weight loss (approximately 4% or less) from 38°F storage were Atlantic, Hilite Russet, Norchip, Norland, Russet Norkotah, Sangre, AF879-3, B0246-7, B0256-

1, ND671-4, and NYE55-44. Selections with very low weight loss (approximately 5% or less) from 50°F storage were Frontier Russet, Hilite Russet, Russet Burbank, Sangre, and ND671-4. MaineChip, Norland, Red Gold, AF845-11, AF875-15, B0178-34, B9792-158 had relatively high weight loss at 50°F.

Overall Summary. Selections from the 1991 NE107 trials that appear particularly promising as late-season, tablestock round-whites are Allegany AF828-5, and NY84. MaineChip, NYE55-44, and B0175-20 have been our most promising chipping lines. Saginaw Gold has produced good yields, attractive tubers, and appears to chip well under most conditions, but is slightly inconsistent for color and specific gravity. AF875-15, B0178-34, NYE55-27, and NYE57-13 have shown promise for chipping, but further testing of these new lines is needed. None of the russeted lines were productive during 1991. Of the group tested, Frontier Russet and B9922-11 appear most promising.

Standard NE107 rating codes for plant and tuber characteristics.

Plant Characteristics

Rating Code	Plant Size	Air Pollution	Vine Maturity	Plant Appearance	Maturity at Vinekill
1	Very Small	Dead	Very Early	Very Poor	Completely Dead
2	+	--	Early	Poor	--
3	Small	Mod. Defol.	+	+	Yellow and Dying
4	+	--	Medium Early	--	--
5	Medium	Mod. Injury	Medium	Fair	Moderately Mature
6	+	--	Medium Late	+	--
7	Large	Mild Injury	+	--	Vines Starting to Mature
8	+	--	Late	Good	--
9	Very Large	No Symptoms	Very Late	Excellent	Vines Green and Vigorous

Tuber Characteristics

Rating Code	Skin Color	Skin Texture	Tuber Shape	Eye Depth	Overall Appearance
1	Purple	Part. Russet	Round	Very Deep	Very Poor
2	Red	Heavy Russet	Mostly Round	--	--
3	Pink	Mod. Russet	Round to Oblong	Deep	Poor
4	Dark Brown	Light Russet	Mostly Oblong	--	--
5	Brown	Netted	Oblong	Intermediate	Fair
6	Tan	Slight Net	Oblong to Long	--	--
7	Buff	Mod. Smooth	Mostly Long	Shallow	Good
8	White	Smooth	Long	--	--
9	Cream	Very Smooth	Cylindrical	Very Shallow	Excellent

Maine Table 1. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for early maturing and red-skinned varieties grown at Presque Isle, Maine - 1991.

Variety	Total Yield cwt/A	Mkt. Yield % of cwt/A	Stand %	Size Distribution by Class ¹ (%)						Size Distribution(%)		Specific Gravity	
				1	2	3	4	5	6	1-7/8 to 4 in.	2-1/2 to 4 in.		
Early Test- 98 days													
Superior (std)	180	159	100	95	4	24	46	26	0	0	96	26	1.075
Chaleur	103	99	62	60	9	41	35	15	0	0	91	15	1.075
Norchip	154	119	75	96	20	58	21	1	0	0	80	1	1.079
AF845-11	128	97	61	83	15	57	22	6	0	0	85	6	1.075
AF1302-1	166	128	80	98	16	44	32	8	0	0	84	8	1.068
AF1333-1	185	158	99	88	9	38	41	12	0	0	91	12	1.070
B0257-3	176	147	92	100	14	45	36	6	0	0	86	6	1.089
NYE55-44	199	194	122	80	4	27	48	20	0	0	96	20	1.077
Waller Duncan LSD (K=100)	19	25											0.002
Red-skinned Test - 110 days													
Chieftain (std)	237	205	100	94	5	24	39	32	0	0	95	32	1.070
Norland	181	160	78	96	8	31	38	22	0	0	92	22	1.066
Reddale	250	215	105	87	2	8	25	61	5	0	98	65	1.066
Red Gold	208	180	88	87	11	36	40	13	0	0	89	13	1.082
ND2224-5R	163	128	62	93	15	58	25	3	0	0	85	3	1.072
Waller Duncan LSD (K=100)	39	44											0.002

¹Size classes for all varieties: 1=1-1/2 to 1-7/8"; 2=1-7/8 to 2-1/4"; 3=2-1/4 to 2-1/2"; 4=2-1/2 to 3-1/4"; 5=3-1/4 to 4"; 6=over 4".

Table 2. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color scores for early maturing and red-skinned varieties grown at Presque Isle, Maine - 1991.

Variety	Plant Data ¹		Tuber Data ¹		Tuber Defects (%)			Hollow Heart Rating ²	Chip Color ³	
	Size 7-24	Vine Matur. at 8-26 Vinekill	Shape	Appearance	Total	Sun-	Mis-			
						burn	shapen cracks			
Early Test- 98 days										
Superior (std)	6	4	5	6	5.6	0.8	4.1	0.7	0	64
Chaleur	3	3	4	7	0.4	0.4	0.0	0.0	0	53
Norchip	4	5	6	5	2.4	0.0	2.4	0.0	0	70
AF845-11	5	3	3	4	1.3	0.5	0.8	0.0	0	70
AF1302-1	5	2	2	5	1.5	1.1	0.2	0.2	0	70
AF1333-1	5	3	3	6	1.9	1.9	0.0	0.0	0	59
B0257-3	5	5	6	6	1.5	1.5	0.0	0.0	0	68
NYE55-44	5	5	5	7	0.3	0.3	0.0	0.0	0	71
Red-skinned Test - 110 days										
Chieftain (std)	6	6	7	7	0.8	0.8	0.0	0.0	0	--
Norland	4	2	3	5	2.7	2.4	0.0	0.3	0	--
Reddale	5	3	2	5	11.7	4.3	0.0	7.4	1	--
Red Gold	5	4	2	3	3.7	3.2	0.4	0.0	0	--
ND2224-5R	3	3	3	8	4.3	3.2	0.0	1.1	0	--

¹See standard NE107 rating system for key to codes.

²Unless otherwise noted, hollow heart rating equals number of hollow tubers found per 40 large tubers cut and examined.

³Chip color -- Agron M35 (higher values indicate lighter color): >60 acceptable; Waller Duncan LSD (K=100) for chip color = 3.

Maine Table 3. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for medium maturing varieties grown at Presque Isle, Maine - 1991.

Variety	Total Yield cwt/A	Mkt. Yield cwt/A	Yield % of std.	Stand %	Size Distribution by Class ¹ (%)						Size Distribution(%)		
					1	2	3	4	5	6	1-7/8 to 4 in.	2-1/2 to 4 in. Gravity	
Medium Test- 109 days													
Kennebec (std)	255	220	100	93	3	9	21	54	13	0	97	68	1.070
Atlantic	275	259	118	97	4	18	38	40	1	0	96	40	1.082
Gemchip	176	153	70	77	10	38	39	13	0	0	90	13	1.068
LaBelle	238	225	102	76	3	9	23	56	8	0	97	65	1.077
MaineChip	245	205	93	97	4	28	44	24	0	0	96	24	1.088
Saginaw Gold	277	233	106	92	5	25	41	27	1	0	95	29	1.075
AF875-15	277	252	115	95	6	26	42	26	0	0	94	26	1.079
B0256-1	236	221	100	92	3	16	35	46	0	0	97	47	1.091
B0257-9	208	198	90	96	3	13	28	54	2	0	97	56	1.088
F77087	228	219	100	82	2	13	28	56	1	0	98	57	1.079
F82026	272	223	101	69	6	23	30	38	3	0	94	41	1.079
NYE11-45	215	189	86	65	3	25	39	33	0	0	97	33	1.067
NYE55-27	284	246	112	91	6	36	47	12	0	0	94	12	1.087
NYE57-13	242	208	94	93	7	34	37	22	0	0	93	22	1.079
NY85	205	175	80	82	5	31	46	17	0	0	95	18	1.085
Waller Duncan													
LSD (K=100)	31	35											0.002

¹Size classes for all varieties: 1=1-1/2 to 1-7/8"; 2=1-7/8 to 2-1/4"; 3=2-1/4 to 2-1/2"; 4=2-1/2 to 3-1/4"; 5=3-1/4 to 4"; 6=over 4".

Maine Table 4. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color scores for medium maturing varieties grown at Presque Isle, Maine - 1991.

Variety	Plant Data ¹		Tuber Data ¹		Tuber Defects (%)			Hollow Heart Rating ²	Chip Color ³		
	Size 8-14	Vine Matur. at 9-6	Matur. at Vinekill	Shape	Appearance	Total	Sun- burn			Mis- shapen	Growth cracks
Medium Test- 109 days											
Kennebec (std)	7	6	7	3	5	12.5	10.9	0.0	1.5	0	58
Atlantic	5	5	6	1	6	4.1	3.1	1.0	0.0	0	61
Gemchip	5	4	4	2	4	0.1	0.0	0.0	0.1	0	63
LaBelle	5	4	5	2	7	1.5	1.3	0.0	0.2	0	56
MaineChip	5	5	6	2	6	6.7	3.9	2.4	0.4	0	69
Saginaw Gold	6	4	4	2	6	1.3	1.0	0.3	0.0	0	65
AF875-15	6	5	5	2	5	3.0	2.0	0.9	0.1	0	63dr
B0256-1	5	6	7	1	6	4.4	1.5	2.9	0.0	0	47
B0257-9	3	5	4	3	6	2.2	2.2	0.0	0.0	0	61
F77087	4	7	7	3	7	2.2	2.1	0.0	0.1	0	65
F82026	6	7	8	2	7	8.4	3.9	4.0	0.4	1	54
NYE11-45	4	6	7	3	3	5.4	1.7	3.7	0.0	0	65
NYE55-27	5	5	5	1	6	3.8	2.7	1.0	0.0	0	66
NYE57-13	5	6	6	1	7	2.5	2.5	0.0	0.0	1	67
NY85	5	4	4	2	7	5.9	3.6	2.3	0.0	0	63

¹See standard NE107 rating system for key to codes.

²Unless otherwise noted, hollow heart rating equals number of hollow tubers found per 40 large tubers cut and examined.

³Chip color -- Agtron M35 (higher values indicate lighter color): >60 acceptable; dr = dark vascular ring. Waller Duncan LSD (K=100) for chip color = 4.

Maine Table 5. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for late maturing and russeted varieties grown at Presque Isle, Maine - 1991.

Variety	Total Yield cwt/A	Mkt. Yield cwt/A	Yield % of std.	Stand %	Size Distribution by Class ¹ (%)						Size Distribution(%)		Specific Gravity
					1	2	3	4	5	6	1-7/8 to 4 in.	2-1/2 to 4 in.	
Late Test- 120 days													
Katahdin (std)	220	221	100	95	3	18	34	42	2	0	97	44	1.076
Allegany	255	257	116	90	2	13	34	46	4	0	98	50	1.078
AF828-5	285	267	121	92	3	12	29	52	3	0	97	56	1.074
AF1060-2	246	245	111	95	4	19	32	43	2	0	96	45	1.082
AK-3-79-209-81	254	257	116	92	3	12	33	46	7	0	97	53	1.078
AK-3-79-235-81	326	305	138	99	4	18	38	39	1	0	96	41	1.077
B0175-20	244	231	104	95	3	12	29	51	5	0	97	57	1.095
B0175-21	177	171	77	90	2	12	29	52	4	0	98	57	1.090
B0178-34	194	187	85	97	5	18	46	31	1	0	95	32	1.089
NYE55-35	206	201	91	59	6	25	40	29	0	0	94	29	1.091
NY78	252	234	106	93	6	24	35	33	1	0	94	35	1.074
NY84	265	247	112	79	5	17	28	44	5	0	95	49	1.075
W-D LSD (K=100)	31	46											0.002
Russet/Processing Test - 120 days													
R. Burbank (std)	176	134	100	100	36	46	14	3	0		17	3	1.082
Frontier Russet	151	146	109	99	23	40	35	2	0		37	2	1.091
Russet Norkotah	155	161	120	98	29	50	21	1	0		22	1	1.087
B9922-11	179	164	122	99	13	60	24	3	0		27	3	1.089
ND671-4	144	128	96	94	35	47	17	1	0		17	1	1.080
W1005Rus	184	156	116	99	30	61	8	1	0		9	1	1.091
W-D LSD (K=100)	33	35											0.004

¹Size classes for late varieties: 1=1-1/2 to 1-7/8"; 2=1-7/8 to 2-1/4"; 3=2-1/4 to 2-1/2"; 4=2-1/2 to 3-1/4"; 5=3-1/4 to 4"; 6=over 4". Size classes for russeted varieties: 1=0 to 4 oz.; 2=4 to 8 oz.; 3=8 to 12 oz.; 4=12 to 16 oz.; 5=over 16 oz.

Maine Table 6. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color scores for late maturing and russeted varieties grown at Presque Isle, Maine - 1991.

Variety	Plant Data ¹		Tuber Data ¹		Tuber Defects (%)			Hollow Heart Rating ²	Chip Color ³	
	Size 8-14	Vine Matur. at 9-6 Vinekill	Shape	Appear-ance	Total	Mis-shapen cracks				
						Sun-burn	Growth			
Late Test- 120 days										
Katahdin (std)	7	7	2	6	1.6	0.3	1.0	0.2	0	56
Allegany	8	9	1	8	2.5	0.4	2.1	0.0	0	60
AF828-5	6	7	1	6	2.8	1.5	1.2	0.0	0	46
AF1060-2	4	6	1	4	0.1	0.1	0.0	0.0	0	55
AK-3-79-209-81	8	8	4	4	2.5	0.4	2.1	0.0	0	41
AK-3-79-235-81	9	8	3	3	5.9	0.0	5.9	0.0	0	41
B0175-20	7	7	4	4	3.8	2.1	0.3	1.4	1	65dr
B0175-21	4	3	1	6	1.8	0.1	0.6	1.1	0	67
B0178-34	5	5	2	4	0.6	0.2	0.4	0.0	0	69
NYE55-35	6	7	1	6	0.6	0.2	0.2	0.2	0	70
NY78	6	7	1	7	1.5	1.3	0.0	0.1	0	65
NY84	6	6	2	6	2.9	0.5	2.0	0.4	0	60dp
Russet/Processing Test - 120 days										
R. Burbank	8	8	8	2	20.7	1.9	11.8	7.0	1	47
Frontier Russet	3	6	7	6	1.1	0.4	0.4	0.3	0	42
Russet Norkotah	4	3	6	6	0.5	0.1	0.0	0.4	0	35
B9922-11	7	5	7	7	4.1	2.4	1.2	0.5	0	46
ND671-4	4	4	5	4	4.5	0.9	3.5	0.0	0	43
W1005Rus	6	8	7	6	8.6	0.8	7.3	0.4	0	56

¹See standard NE107 rating system for key to codes.

²Unless otherwise noted, hollow heart rating equals number of hollow tubers found per 40 large tubers cut and examined.

³Chip color -- Agtron M35 (higher scores indicate lighter color): >60 acceptable;

Waller Duncan LSD (K=100) for chip color -- lates = 4; russets = 6. dr=dark vascular ring; dp=dark pith.

Table 7. French fry color and texture of selected potato clones and varieties under simulated processing conditions. All varieties were grown at Presque Isle, Maine during 1990.

Variety	Color Grade ² Rating Index	Grayness ³ Index	Mealiness ⁴ Index	Comments ⁵	Overall Rating ⁶
Russet Burbank (std)	0	1.7	4.0		0
BeIRus	00	0.8	4.0	U	-
Frontier Russet	0	2.0	4.0	U	0
HiLite Russet	0	2.0	4.0	Ir, B1	-
Russet Norkotah	0	2.0	4.0	U	0
AF522-5	0	2.0	4.0	U	0
B0220-14	000	0.3	4.0	U	+
ND671-4	0	2.0	3.9	Gr, Ir, B1	-
NSL1	0	2.0	4.0	Ir, B1	-
Waller Duncan LSD (k=100)	0.4	NS	1.1		

¹Two center raw tuber slices were cut from each of ten tubers. The slices were rinsed in cool water, blanched for 8 minutes at 170°F, par-fried at 375°F for 80 seconds, and quick frozen at -30°C in plastic bags. Four such replications were processed and held at -15°F until evaluation. Prior to evaluation, samples were finish-fried at 360°F for 2-1/2 minutes, blotted dry with a paper towel, and cooled for 6 minutes. All samples were processed and evaluated by T. Work of the Department of Food Science, University of Maine; Orono, ME. Blanching and par-fry were conducted on January 10, 1991. Finish-fry and evaluations were conducted at a later date. All tuber samples were stored at 50°F, 85% R.H. from harvest until processing.

²Color Grades are from U.S.D.A. color standards chart #64-1, third edition.

³Grayness indices represent weighted means derived from the following evaluation scale: 4 = no graying; 3 = slight graying; 2 = moderate graying; 1 = intense graying.

⁴Mealiness indices represent weighted means derived from the following evaluation scale: 5 = dry, mealy; 4=mod. mealy, sl. moist; 3 = sl. mealy, mod. moist; 2 = soggy, not mealy; 1 = very soggy, not mealy.

⁵Comments: U = uniform fried color; Ir = french fries were irregular in color; dark blotches detracted from appearance of product; Be = Dark blotches on ends of many fries; Bc = Dark blotches in centers of many fries; B1 = general blotchy appearance of fries.

⁶Overall rating: quality rated better (+), not different (o), or poorer (-) than Russet Burbank.

Maine Table 8. Chip color from 38°F, 45°F, and 50°F storage, reconditioning potential, after-cooking darkening indices, washed appearance ratings, days to sprout formation, and storage weight losses at 38°F and 50°F for 49 potato varieties grown at Presque Isle, Maine during 1990 and stored during the 1990-1991 storage season.

Variety	Chip Color from Storage		After-Cooking Darkening ³	Washed Appearance Index ⁴	Days to Indicated Sprout Length ⁵	Storage Wt. Loss %	
	50°F ¹	45°F ¹				38°F ¹	50°F ¹
	Recond. ²				PIP	1/2"	
Allegany	46	32	7.8	91(7) SB,B,SZ	130	172	5.7
Atlantic	49	48	7.6	85(5) SS,SZ	99	157	3.2
BelRus	49	34	7.6	54(5) BS,SZ	90	130	6.9
Chaleur	42	--	8.3	87(5) PC,SZ	107	157	5.6
Chieftain	--	--	7.6	97(8) PC,SS,SZ	117	168	4.8
Coastal Chip	49	46	8.5	91(3) PC,SS,SZ	113	157	5.0
Frontier Russet	38	29	8.2	70(5) M,BS,SZ	90	159	5.3
Hilite Russet	39	28	8.2	65(5) PC,SB,SS,B	89	152	3.0
Katahdin	48	27	7.7	91(4) M,PC,SB,SS,B	95	158	7.7
Kennebec	51	51	8.0	74(3) PC,SS,BS,B	134	178	4.9
LaBelle	49	46	7.8	82(6) PC,SS,B	99	141	5.4
LaRouge	--	--	8.2	95(4) PC,SS,SZ	138	182	4.2
MaineChip	53	53	8.5	87(4) M,PC,SS,SZ	99	157	6.4
Norchip	55	52	8.0	72(3) PC,SS,SZ	107	164	3.8
Norland	--	--	8.6	91(7) PC,SS,SZ	103	145	4.0
Red Gold	--	--	7.8	71(2) SS	91	138	6.1
Reddale	--	--	8.6	97(6) M,NR,BS,SZ	124	168	4.9
Russet Burbank	40	27	7.2	42(3) BS	124	194	4.4
Russet Norkotah	37	--	7.6	78(7) PC,SS,SZ	124	166	3.5
Saginaw Gold	53	51	8.3	88(5) SS,SZ	134	171	6.3
Sangre	--	--	8.5	76(6) PC,BS	124	168	3.3
Superior	49	44	8.0	94(6) NR,SZ	127	164	5.0
AF522-5	36	--	8.4	59(5) PC,SS,B	103	145	5.3
AF828-5	39	--	8.5	98(7) PC,SS,BS,B	109	151	8.4
AF845-11	52	51	8.1	69(2) PC,SS,BS,B	107	148	6.2

Maine Table 8 cont.

Variety	Chip Color from Storage		After-Cooking ³ Darkening ³	Washed Appearance ⁴ Index	Days to Indicated Sprout Length ⁵	Storage Wt. Loss %	
	50°F ¹	45°F ¹ 38°F ¹ Recond. ²				38°F	50°F
AF875-15	51	47	31	47	92	141	4.8
AF879-3	52	49	26	54	120	171	2.8
AF1060-2	37	--	--	--	89	137	6.5
B0172-15	56	53	33	53	89	144	9.2
B0175-20	53	50	29	52	77	144	8.1
B0175-21	50	44	25	50	89	151	9.5
B0178-34	52	49	34	54	89	130	8.5
B0220-14	50	50	35	47	90	145	5.8
B0246-7	48	43	23	52	87	134	3.6
B0256-1	44	39	20	48	77	127	3.8
B0257-3	54	54	39	54	120	171	4.1
B0257-9	51	53	38	51	113	157	4.3
B9792-88	50	48	27	49	89	151	9.1
B9792-158	50	48	34	54	92	148	4.6
B9955-46	55	55	48	56	113	157	5.5
F77087	53	52	27	54	120	164	5.4
F82026	46	--	--	--	120	171	6.4
ND671-4	41	38	26	40	90	159	3.3
NYE55-27	49	48	26	49	99	148	4.6
NYE55-44	57	59	38	57	134	178	3.7
NYE57-13	53	54	23	57	148	199	4.2
NY78	50	--	--	--	82	130	7.8
NY84	37	--	--	--	77	130	9.0
							5.6

¹Stored at 38°F, 45°F or 50°F, 85% R.H. from harvest until mid-February. Chip color scores are from an Agron Model M-35 Process Analyzer (Agron, Inc., Sparks, Nevada; calibrated with black disk "0" = 0 and white disk "90" = 90). Chips were crushed and reported values are means from four replicate

samples. Each sample was read three times and was thoroughly mixed between readings. Higher numbers indicate lighter chip colors with ≥ 50 being acceptable, 48 to 50 marginal, and ≤ 48 unacceptable.

²Reconditioned samples were taken from 38°F and placed at 70°F for a 3-week period starting on January 18, 1991. See Agtron description under footnote #1.

³Samples were stored at 45°F, 85% R.H. from harvest until March 20, 1991, and were then warmed to 65°F for 96 h. Diced tubers were blanched for 5 min., cooled to 120°F, then rated after 30 min. with a Munsell Neutral Color Scale. Higher indices indicate lighter color.

⁴Unreplicated samples weighing approximately 7500 grams were stored at 45°F and 85% R.H. until mid-January. Tubers were then washed and graded. First number indicates % u.s.#1 grade tubers in sample. Numbers in parentheses indicate subjective appearance of the sample using standard NE-107 appearance code. Codes indicate major external defects as follows: M=misshapen, NR=nonuniform russetting, PC=poor color, SB=sunburn, GC=growth cracks, CS=common scab, SS=silver scurf, RS=russet scab, DR=dry rot, SR=soft rot, BS=black scurf, LE=enlarged lenticles, B=bruises, BH=buttonhole, PS=pitted scab, SZ=small tuber size, ST=stolons adhere to tubers, SC=skin cracks, PE=pink eye, SK=skinning, AC=air cracks, and P=pear-shaped.

⁵Tubers were stored at 45°F, 85% R.H.

⁶Percentage sprout and weight loss following storage from harvest until March 15, 1991 at indicated temperature and 85% R.H.

MAINE -- 1991

Alvin F. Reeves, Robert B. Long, Garland S. Grounds, and Arnold A. Davis.

Potato Breeding

Seed and seedling production. Emphasis continues to be on the development of a long russet processing variety. A total of 28 parent plants were intercrossed in 30 different combinations to produce 31,850 seeds. An additional 310,400 seeds were obtained from 18 field plantings. Greenhouse plantings of true seeds yielded 76,648 seedlings from which 48,325 tubers were harvested.

Seedling selection. A total of 226 (0.7%) new selections were saved from 31,996 single hills. From the 190 12-hill plots, 45 (23.7%) were saved for further testing. Fifty-four 60-hill plots, and 123 advanced selections were maintained and tested.

Protoclinal selections. Field testing of clones derived from Russet Burbank leaf cells included replicated yield tests of five of the advanced protoclines. Four were equal to the standard Russet Burbank in yield and specific gravity.

Selection
Screening

Disease tests. In cooperation with Drs. Franklin Manzer, Richard Storch, Bill Brodie, Robert Goth, Gilbert Banville, John Wells, and Simeon Leach, a number of selections were tested for resistance to several diseases. All tests were inoculated either directly or on spreader rows within the plots. Results were as follows: 11 of 77 selections tested were resistant to late blight; 36/77 to acid scab; 13/89 to common scab; 4/9 to leafroll; 38/84 to Verticillium; 19/91 to golden nematode; and 3/8 to soft rot.

Physiological disorders. Additional tests for physiological disorders showed 46 of 79 resistant to hollow heart; 34/56 to blackspot bruising; and 10/58 to shatter bruising.

Yield tests. A total of 116 selections were grown in replicated yield tests in 1991. Thirty-two yielded better than the control varieties and 12 had higher specific gravities. Three selections were better for both qualities. Early maturing selections were given 120 pounds of nitrogen per acre and killed at 90 days from planting; medium-early maturity selections were killed at 102 days. Medium maturing selections were given 140 pounds of nitrogen and killed at 98 days. Medium-late maturing selections were given 120 pounds of nitrogen and killed at 102 days. Late maturing selections were given 160 pounds of nitrogen and killed at 112 days.

Chip tests. After processing in December and February from five different storage temperatures, twelve selections had better average chip color than Monona: ND 860-2, AF 1452-28, AF 1452-5, CS 7232-4, AF 1433-4, AF 1424-7, AF 1452-2, AF 1424-1, AF 1424-6, MaineChip, Somerset, and AF 1433-5.

Processing and Cooking tests. Terry Work (Food Sciences Department of the University of Maine, Orono) conducted french fry tests of 15 selections, and cooked quality tests for nine selections from 1990 plantings. For french fry quality, eight selections were better than the three checks in color, and one selection was worse. Three selections were equal to BelRus and better than Shepody in mealiness, whereas three others were poor in texture. In the baked product tests, three of the six round white selections were higher than Katahdin in total solids and one was lower. Two of the three russet selections were rated less mealy than Russet Burbank. However, all selections were judged equal to the standard in acceptability for color, flavor, and texture.

Commercial Trials Grower trials of advanced selections. Along with MaineChip and Prestile, six unnamed selections were grown on commercial farms in 1991. Results were promising for most of them, and one will be named in 1992.

Chipping selections: CS 7232-4 had better yields in 1991 (275 Cwt/A), but there is still some doubt that it will yield enough for commercial production. It does have excellent chip color from storage. AF 875-15 is showing promise, especially for areas that chip directly from the field. Its yield was 324 Cwt/A in 1991. AF 845-11 had good yields (347 Cwt/A) and size in one grower field in 1991, but has been dropped from NE-107 testing because of poor size and yields.

Round white table varieties: CS 7697-24 gave slightly better yield than Superior and more chefs. It will be named in 1992. AF 828-5 yielded 320 Cwt/A with good size and appearance. AF 1060-2 gave high yields with uniform sizing, mostly 2-1/4" to 3-1/4".

Maine Table 1 summarizes the advanced selections in the Maine potato breeding program.

Pedigree	Resistance to 5/																		
	Maturity 1/	Skin color 2/	Tuber type 3/	Yield 4/	Cooked quality 4/	Chip Color 4/	Percent dry matter 4/	Storage qualities 4/	Bruising 4/	Hollow Heart 4/	Virus X	Leafroll	Net necrosis	Late blight	Early blight	Acid scab	Common scab	Verticillium	Golden nematode
Round white tablestock																			
Early Maturing																			
AF1331-2	ME	W	R, fl	G	G	U	A	F	E	C	F	S	R	S	S	M	M	S	S
AF1333-1	E	WN	RO	E	M	U	M	F	E	A	F	F	R	S	S	R	R	S	S
AF1425-1	M	W!	R	G	F	A	G	F	G	A	F	S	R	S	S	M	M	S	S
AF1437-1	ME	WCN	R	E	F	U	U	F	A	A	F	S	R	S	S	S	S	S	S
AF1438-4	E	WN	R	G	F	M	M	F	A	E	F	S	R	S	S	S	S	S	S
AF1438-5	E	CN	R	E	F	U	U	F	A	G	F	S	R	S	S	S	R	S	S
AF1438-6	ME	WN	R	E	F	U	U	F	A	E	F	S	R	S	S	S	S	S	S
AF1470-6	E	W	R	E	F	U	U	F	E	E	F	S	R	S	S	S	S	S	S
AF1470-7	ME	CN	R	E	F	M	U	F	G	A	F	F	R	S	F	S	S	S	S
AF1470-20	ME	WC	R	E	F	U	U	F	E	E	F	F	R	S	S	S	S	S	S
AF1470-25	E	W!	R	E	F	U	U	F	M	E	F	F	R	S	S	M	S	S	S
AF1470-28	ME	WN	R	E	F	U	M	F	G	E	F	F	R	S	S	S	S	S	S
CS7697-24	E	W	R	E	G	M	M	G	A	C	S	F	R	S	S	S	S	S	S
Mid Season																			
AF 828-5	ML	W	R	G	G	M	M	G	E	E	S	S	R	M	R	S	S	S	S
AF1060-2	ML	W	R	E	A	U	A	G	E	E	F	S	R	M	R	S	R	R	M
AF1302-1	M	W!	R	A	G	U	M	F	M	M	F	R	S	S	S	M	S	S	S
AF1426-1	ME	WC	RO	G	F	A	A	F	G	A	F	S	S	M	M	S	M	S	S
AF1438-1	M	WN	RO	G	F	A	A	F	E	E	F	S	R	M	M	S	M	S	S
AF1470-18	M	W	R	E	F	M	M	F	A	E	F	F	R	S	S	S	S	S	S
AF1470-29	ML	WN	R	E	F	U	U	F	E	E	F	F	R	S	S	S	S	R	M

Pedigree

Resistance to $\frac{5}{/}$

Pedigree	Maturity $\frac{1}{/}$	Skin color $\frac{2}{/}$	Tuber type $\frac{3}{/}$	Yield $\frac{4}{/}$	Cooked quality $\frac{4}{/}$	Chip color $\frac{4}{/}$	Percent dry matter $\frac{4}{/}$	Storage qualities $\frac{4}{/}$	Bruising $\frac{4}{/}$	Hollow Heart $\frac{4}{/}$	Virus X	Leafroll	Net necrosis	Late blight	Early blight	Acid scab	Common scab	Verticillium	Golden nematode
Round white tablestock																			
Full Season																			
AF1470-17	ML	W	R	E	F	U	U	F	E	A	F	F	R	S	M	M	S	M	S
AK3-79-209-81	ML	W	O	G	A	U	U	F	E	G	F	S	R	M	M	M	M	R	S
AK3-79-235-81	ML	W	O	E	G	U	A	F	E	M	F	S	R	M	M	M	M	R	S
Prestile	L	W	RO	G	M	M	G	G	M	M	R	S	R	M	M	M	M	M	S
Long russets for processing or count box																			
AF1166-4	M	R	RO	G	G	G	A	F	G	M	F	M	R	S	R	S	M	R	S
AF1337-2	E	BN	OL	G	G	U	M	F	E	E	F	S	R	S	S	M	M	M	S
AF1367-9	ME	WC	OL	A	M	U	M	F	E	M	F	S	R	S	M	S	S	S	S
AF1367-11	M	R	OR	G	M	U	A	F	E	E	F	S	R	S	S	R	S	S	S
AF1481-4	M	R	O	G	M	M	A	F	E	E	F	S	R	S	S	R	S	S	S
AF1481-7	ME	WC	OL	G	F	M	G	F	E	E	F	S	R	S	S	R	S	S	S
AF1484-4	M	WN	RO	G	F	M	E	F	E	A	F	S	R	S	S	R	S	M	S
AF1499-2	M	R	O	G	U	U	M	F	E	M	F	S	R	S	S	R	S	M	S

Maine Table 1. Continued

Pedigree	Resistance to <u>5/</u>																		
	Maturity <u>1/</u>	Skin color <u>2/</u>	Tuber type <u>3/</u>	Yield <u>4/</u>	Cooked quality <u>4/</u>	Chip color <u>4/</u>	Percent dry matter <u>4/</u>	Storage qualities <u>4/</u>	Bruising <u>4/</u>	Hollow Heart <u>4/</u>	Virus X	Leafroll	Net necrosis	Late blight	Early blight	Acid scab	Common scab	Verticillium	Golden nematode
Chipping types																			
MaineChip	ML	W	R	G	G	E	E	A	G	G	S	S	R	S	S	M	S	R	S
Somerset	ME	WC	OL	A	A	E	G	A	A	A	S	S	R	S	S	S	S	S	S
AF875-15	M	WC	R	A	G	E	E	F	G	E	F	F	R	S	M	M	M	S	S
AF1377-6	M	WN	R	A	F	A	G	F	A	A	F	F	R	M	M	S	S	S	F
AF1424-6	ME	WC	R, FL	G	F	E	E	F	G	E	F	R	R	M	M	M	S	S	S
AF1424-7	ME	WC	R	A	F	E	E	F	E	E	F	S	R	M	M	S	S	S	S
AF1433-4	ME	W	R	G	F	E	G	F	G	A	F	F	R	M	M	S	S	S	R
AF1433-5	M	W	R	A	F	E	E	F	A	M	F	S	R	M	M	S	S	S	R
AF1452-28	M	W	R	E	F	E	M	F	A	E	F	F	R	M	M	S	S	S	S
AF1466-36	M	WC	RO	G	F	E	E	F	A	G	F	F	R	S	S	R	R	S	F
AF1466-37	M	CN	RO	A	F	M	E	F	E	A	F	F	R	S	S	R	R	S	R
AF1466-48	ME	WC	R	E	F	A	A	F	G	G	F	F	R	S	S	R	S	S	S
CS7232-4	E	WC	R	M	G	E	A	G	E	E	S	S	R	S	S	M	M	S	S

1/ E = early, M = medium, L = late.

2/ W = white, C = cream, B = buff, R = russet, N = netted, L = light.

3/ R = round, O = oblong, L = long, fl = flat.

4/ Rated as U = unacceptable, M = marginal, A = acceptable, G = good, E = excellent, F = further testing needed.

5/ R = resistant, M = moderately resistant, S = susceptible, F = further testing needed.

MICHIGAN

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I. 1991 POTATO VARIETY

The objectives of the evaluation and the management studies are to identify superior varieties for fresh market or for processing and to develop recommendations for the growers of those varieties. The varieties were compared in groups according to the tuber type and skin color and to the advancement in selection. The most promising varieties are tested in management profile studies for their reaction to spacing and nitrogen fertilization. Total and marketable yields, specific gravity, tuber appearance, incidence of external and internal defects, chip color, consistency and after cooking darkening as well as susceptibilities to common scab and bruising were determined. Before testing for chip color, the varieties were stored at 45 and 50°F.

The field experiments were conducted at the Montcalm Research Farm in Entrican, MI. They were planted in randomized complete block design, in four replications. The plots were 23 feet long and spacing between plants was 12 inches. Inter-row spacing was 34 inches.

Both round and long variety groups were harvested at two dates. The yield was graded into four size classes, incidence of external and internal defects was recorded, and samples for specific gravity, chipping, bruising and cooking tests were taken.

ROUND WHITE VARIETIES

Results

Nine varieties and 10 breeding lines were included in the trial. Atlantic, Eramosa, Onaway and Superior were used as checks. The average yield was higher than in 1989 and 1990. The results are summarized in Tables 1 and 2.

NY87 at first date of harvest yielded significantly more U.S. No. 1 tubers than any other variety. However, 31 out of 39 over 3¼" tubers checked were hollow. At the second harvest date, NY87 yielded on the level of Atlantic and Onaway. NYE55-44 yielded on the level of Atlantic and Onaway at first harvest, being inferior to both at second harvest. It can be classified as an early variety with very attractive tubers. The

performance of NYE55-35 confirmed its high potential as chipping variety. At the second harvest, its yield and specific gravity were comparable to those of Atlantic but it has a better internal quality than Atlantic. Two Wisconsin lines W856 and W870 were also in this class, while W887 yielded less than Atlantic, but had higher specific gravity (1.10). Calchip was a good yielder and had very high specific gravity, but has a very late maturity, rather small tubers and a high incidence of hollow heart this season. Eramosa, Superior, and Mainechip yielded much below the best varieties. Mainechip, however, had high specific gravity, good internal quality and has excellent chipping color.

Variety Characteristics

Eramosa - very early variety with smooth, round to oval tubers of good appearance. Yield potential and specific gravity very low. Has few internal defects. Susceptibility to silver scurf was noted after harvest and storage. Has potential as a early fresh-market variety.

Onaway - medium-early fresh market variety with excellent yield potential and a low specific gravity. Tubers are round to oblong, large, deep eyes, susceptible to growth cracks and early blight. Very good internal quality, storability poor.

Atlantic - medium-late, chipping variety of high specific gravity and good yield potential. Susceptible to scab, soft rot, white knot, and to internal defects (hollow heart, vascular discoloration, internal brown spot).

Superior - medium-early, fresh market variety. Tubers well-shaped, medium size, specific gravity medium. Resistant to scab but susceptible to *Verticillium* wilt.

Calchip - very late, high yielding, high specific gravity, chipping variety. Tubers well shaped, but rather small and have a tendency to hollow.

Gemchip - late, high yielding, fresh market and chipping variety. Tubers large, round to oblong, of good appearance. Specific gravity low. Some tendency towards hollow heart was noted.

Mainechip - medium-late variety of excellent chipping quality. Comparable to Atlantic in specific gravity, lower yield potential, but better internal quality. Tubers are rather small.

Norwis - medium-late, high yielding variety. Tubers are large, yet do not hollow. Excellent internal quality. Specific gravity too low for chipping industry.

Spartan Pearl - medium-early, fresh market variety. Yield potential above average. Tubers well-shaped, uniform in size, and attractive. Specific gravity medium, good internal quality, but shows some tendency for after-cooking darkening. Susceptible to scab and growth crack.

MS401-1 - yellow-flesh variety with outstanding chipping quality. Tubers well-shaped, but rather small. Specific gravity below that of Atlantic. Yield potential below average. Its major drawbacks are strong tendency to hollow heart and susceptibility to scab.

MS402-8 - early, fresh market variety. Yield potential is low, slow emergence, but has long dormancy. Plan to delete from program.

B9792-61 - early variety from USDA-Beltsville breeding program. Yield potential too low.

NY87 - late variety, but sets tubers early. It was top yielder at both harvest dates. Tubers are large, but have a strong tendency to hollow heart and specific gravity is low for chip processing.

NYE55-35 - late, medium to high yielding with high specific gravity and good chipping quality. Tubers well-shaped, medium large and uniform in size. Few internal defects and reported to have scab tolerance. Has a good potential in Michigan.

NYE55-44 - medium-early, fresh market variety. Chipping quality is good but specific gravity rather low. Tubers are medium large, uniform, well-shaped and good general appearance. Good potential in Michigan.

W856 - very late, fresh market and chipping variety with a high yield potential. Specific gravity slightly below that of Atlantic. Tubers large, eyes are deep, few internal defects,

W870 - medium-late, chipping variety. Yield potential and specific gravity high. Tubers are medium-large and slightly flat. Few internal defects and has a good potential in Michigan.

W877 - medium late, chipping variety. Average yield potential with high specific gravity. Tubers uniform in size, well-shaped and few internal defects.

W887 - very late, high yielding and high specific gravity chipping variety. Tubers large, a little flattened, eyes rather deep. Average internal quality. Tendency to shatter bruise and short dormancy were noted.

LONG VARIETIES

Seven varieties and three breeding lines were tested and harvested 96 and 143 days after planting. The data are summarized in Tables 3 and 4.

Castile has confirmed its outstanding yield potential. It is very late, but sets tubers early. It was the top yielder at both harvest dates. Of the breeding lines, W1005 was the best yielder at both harvest dates. All other varieties and breeding lines yielded below the level of Russet Burbank. Two breeding lines A78242-5 and MN12171 were at the very low end with respect to yield.

W1005, Ranger Russet and ND1538-1 (tested in North Central Region trial) are the only russet lines of some potential in Michigan. Incidence of hollow heart was generally high among long varieties. However, no hollow heart, despite its large tubers, was noted in Castile.

Variety Characteristics

Castile - very late variety of very high yield potential. Tubers are very large oblong, and well-shaped, yet do not hollow. White skin and good appearance. Specific gravity is medium, and internal defects are few. Susceptible to blackspot and some incidence of *Altenaria solani*. Early blight was noted on tubers during storage.

W1005 - late, high yielding variety. Tubers are long and rather thin. Specific gravity high. Resistant to scab, susceptible to blackspot.

Ranger Russet (A7411-2) - late, medium yielding, high specific gravity variety. Tubers are large and have good appearance. Few internal defects. Excellent potential for processing. Susceptible to blackspot.

Frontier Russet medium-late variety with average yields. Specific gravity medium. Tuber appearance and cooking quality good. Shows some resistance to scab and some tendency to hollow heart.

Russet Burbank - used as a standard in the trial. Late maturity, average yields. Specific gravity good for processing. Has a tendency to form off-shape and undersize tubers. Excellent appearance after boiling. Resistant to scab.

Hilite - medium maturity with average yield and specific gravity. Has a tendency towards hollow heart.

Russet Norkotah - early to mid-season variety. Yield potential and specific gravity rather low. Tubers oblong to long, well shaped. Resistant to scab. Some after cooking darkening and susceptible to *Verticillium* wilt.

Eide Russet (MN10874) - medium-late, medium yield potential, low specific gravity. Tubers oval to oblong with few internal defects. Resistant to scab and susceptible to blackspot.

A78242-5 - medium-late, average yield potential, medium specific gravity. Tubers well-shaped, blocky and attractive. Tendency for hollow heart and brown centers was recorded in 1991. Leaves may display mosaic at early stage which is not due to virus infection.

MN12171 - medium early, low yield potential, with specific gravity comparable to Russet Burbank. Few internal defects.

ADAPTATION TRIAL

Twenty-one advanced breeding lines from various states were compared to eleven varieties in the Michigan adaptation trial (Table 5). This experiment serves as a screen for the more intensive dates of harvest evaluations in the following years. Castile and Steuben confirmed their excellent yield potential. Five breeding lines - B0172-15, AC80545-1 (Chipeta), B0202-4, B0257-12, and S438 were comparable to Castile and Steuben in yield. The most promising lines for fresh market are AC80545-1 and B0257-12. Both have well-shaped tubers, but their specific gravity is too low for chipping. B0172-15 had a strong tendency for hollow heart. B0202-4 had irregular tuber shape, was heavily infected with pitted scab, and showed tendency to form hollow heart. S438 was very late and had strong stolons. B0405-4, W887, and W842 yielded less than Castile and Steuben, but had very high specific gravity, an acceptable tuber shape, and good chipping quality. W952, S440, and E57-13 had excellent chipping quality, but their yield potential was low. S440 had small tubers. E55-27, the top yielder in 1990, had an average yield in 1991. Since it is medium-late and a good chipper, it will be tested further.

ROUND WHITES DATES OF HARVEST
MSU MONTCALM RESEARCH FARM
AUGUST 11, 1991 (93 DAYS)

VARIETY	YIELD(CWT/AC)		PERCENT SIZE DISTRIBUTION					DEFECTS*		3-YEAR AVE.	
	US	#1 TOTAL	US#1	<2"	2-3 1/4"	>3 1/4"	PO	SP.GR.	HH	VD	US#1
NY87	475	510	93	6	77	16	1	1.077	31	0/39	---
W870	409	463	88	11	81	7	1	1.098	4	0/26	---
NYE55-44	406	428	95	5	90	6	0	1.077	1	0/10	---
ATLANTIC	394	432	91	9	78	13	0	1.095	16	0/33	325
ONAWAY	389	450	86	7	69	18	7	1.071	0	0/37	399
MS401-1	387	457	85	15	82	3	0	1.085	7	0/11	341**
NORWIS	378	403	94	5	64	31	1	1.072	1	0/33	359**
GEMCHIP	374	420	89	10	81	8	1	1.076	6	0/27	330**
SPARTAN PEARL	366	444	82	16	78	5	1	1.081	0	0/19	362**
W856	365	395	93	5	82	11	2	1.082	4	0/22	---
W887	355	375	95	5	80	15	1	1.096	3	1/33	---
NYE55-35	334	391	85	14	77	8	1	1.089	4	0/20	---
SUPERIOR	334	372	90	8	88	1	3	1.074	0	1/4	322**
ERAMOSA	321	351	91	6	75	16	2	1.064	1	0/29	319
MAINECHIP	313	362	86	12	86	0	2	1.093	0	0/0	302
W877	275	347	79	21	78	1	0	1.101	1	0/3	---
CALCHIP	251	327	77	23	77	0	0	1.107	0	0/0	---
MS402-8	225	255	88	9	80	8	3	1.069	2	0/16	---
B9792-61	188	243	77	18	77	0	4	1.073	1	0/1	---
AVERAGE	---	---	---	---	---	---	---	---	---	---	---
	344	391	88					1.083			
LSD (.05)	65	67						0.003			

*NUMBER OF DEFECTS/NUMBER OF OVERSIZE TUBERS CUT HH=hollow heart VD=vascular discoloration

**TWO-YEAR AVERAGE
PLANTED MAY 10, 1991

1991 ROUND WHITES-SECOND DATE OF HARVEST
MSU MONTCAIM RESEARCH FARM
SEPTEMBER 16, 1991 (129 DAYS)

VARIETY	YIELD(CWT/AC)		PERCENT SIZE DISTRIBUTION					DEFECTS *				3-YEAR AVE.	
	US#1	TOTAL	US#1	<2"	2-31/4"	>31/4"PO	SP.GR.	HH	BC	IBS	VD	US#1	US#1
NY87	593	617	96	4	66	31	0	1.075	26	0	0	0/40	---
ATLANTIC	592	615	96	3	72	24	1	1.092	10	1	1	0/40	418
ONAWAY	566	603	94	4	70	24	2	1.072	0	0	0	0/40	478
W856	543	572	95	3	68	27	2	1.085	3	0	0	4/40	512**
NYE55-35	528	571	92	8	77	16	0	1.091	5	0	3	0/39	460**
CALCHIP	527	595	89	11	84	5	0	1.112	10	0	0	3/19	---
NORWIS	526	544	97	3	51	46	0	1.068	8	1	0	0/40	498**
W870	518	558	93	6	80	13	1	1.095	4	1	1	0/39	460**
GEMCHIP	517	567	91	8	75	16	1	1.071	5	0	0	0/40	499**
W887	485	515	95	3	55	40	3	1.100	5	1	1	4/40	---
NYE55-44	444	473	94	6	86	8	0	1.075	4	0	0	0/26	435**
SPARTAN PEARL	420	489	86	14	82	4	1	1.079	0	0	1	0/15	430
W877	402	464	86	13	81	5	0	1.099	2	0	1	0/19	386**
MAINECHIP	379	432	88	11	85	3	1	1.089	0	0	0	0/10	347
MS401-1	377	454	83	16	77	6	1	1.082	20	0	0	0/24	362
SUPERIOR	358	407	88	11	84	4	1	1.071	1	0	0	0/15	391**
ERAMOSA	320	362	88	8	75	13	3	1.060	0	0	0	1/27	324
MS402-8	292	316	92	5	77	16	3	1.067	4	0	0	0/27	276
B9792-61	220	263	84	15	80	3	1	1.071	3	1	1	0/17	---
AVERAGE	---	---	--	---	---	---	---	---	---	---	---	---	---
LSD (.05)	82	84	91					1.082					
								0.004					

*NUMBER OF DEFECTS/NUMBER OF OVERSIZE TUBERS CUT HH=hollow heart; BC=brown center;
IBS=internal brown spot; VD=vascular discoloration

**TWO-YEAR AVERAGE

PLANTED MAY 10, 1991

FIRST DATE OF HARVEST
LONG VARIETIES
MSU MONTCALM RESEARCH FARM
AUGUST 14, 1991 (96 DAYS)

VARIETY	YIELD (GWT/AC)		PERCENT SIZE DISTRIBUTION				SP. GR.	HH *	3-YEAR AVE.
	US #1	TOTAL	US #1	<40Z	4-100Z	>100Z			
CASTILE	409	496	82	17	61	22	1.0833	0/40	409
W1005	346	484	71	27	66	6	1.0908	4/21	362**
R. NORKOTAH	337	427	79	18	61	18	1.0737	4/40	287
FRONTIER (LC)	319	394	81	18	58	23	1.0768	11/38	276
FRONTIER (PAVEK)	307	406	75	21	56	20	1.0771	20/36	276
A78242-5	303	360	84	16	66	18	1.0783	5/34	290
R. BURBANK	295	449	65	28	58	7	1.0838	11/25	241
EIDE RUSSET	293	391	75	24	63	12	1.0793	5/32	278
RANGER RUSSET	269	377	71	25	66	5	1.0888	3/13	283
HILITE RUSSET	267	347	77	21	57	20	1.0685	14/40	257**
MN12171	167	279	59	34	51	8	1.0873	5/16	---
AVERAGE	301	401	74				1.0807		
LSD (.05)	65	72					0.004		

* NUMBER OF DEFECTS/NUMBER OF OVERSIZE TUBERS CUT HH=hollow heart

**TWO-YEAR AVERAGE

PLANTED MAY 10, 1991

SECOND DATE OF HARVEST
LONG VARIETIES
MSU MONTCALM RESEARCH FARM
SEPTEMBER 30, 1991 (143 DAYS)

VARIETY	YIELD(CWT/AC)		PERCENT SIZE DISTRIBUTION					SP.GR.	DEFECTS*					3-YEAR AVE.
	US #1	TOTAL	US #1	<4OZ	4-10OZ	>10OZ	PO		HH	VD	BC	IBS	JE	US#1
CASTILE	612	686	88	12	66	23	0	1.0816	0	0	0	0	0/40	543
W1005	528	631	83	13	61	23	4	1.0873	9	0	0	1	0/40	445
RUS. BURBANK	461	585	79	16	56	23	4	1.0823	21	1	1	1	0/40	330
HILITE RUSSET	446	515	85	14	59	26	1	1.0738	19	0	0	0	0/40	322
FRONTIER(LC)	414	496	83	14	57	26	3	1.0756	18	3	0	0	0/40	339
RUS. NORKOTAH	407	513	80	16	55	25	4	1.0811	6	2	0	0	4/39	313
RANGER RUS	384	466	82	17	64	18	1	1.0890	8	1	0	0	0/40	372
FRONTIER(PAV)	333	419	80	17	59	21	3	1.0740	15	1	0	4	0/38	339
EIDE RUSSET	331	394	84	14	62	22	2	1.0725	8	2	0	1	0/39	312
A78242-5	329	397	82	14	57	25	4	1.0804	17	0	0	14	0/40	336
MN12171	273	369	72	23	57	15	5	1.0811	5	2	0	4	0/23	---
AVERAGE	411	497	82					1.0799						
LSD (.05)	176	187						0.010						

*NUMBER OF DEFECTS/NUMBER OF OVERSIZE TUBERS CUT HH=hollow heart; VD=vascular discoloration;
 BC=brown center; IBS=internal brown spot;
 JE=jelly end

PLANTED MAY 10, 1991

ADAPTATION TRIAL
MSU MONTCALM RESEARCH FARM
SEPTEMBER 25, 1991 (138 DAYS)

VARIETY	YIELD(CWT/AC) PERCENT SIZE DISTRIBUTION							DEFECTS*				
	US #1	TOTAL	US #1	<2"	2-3 1/4"	>3 1/4"	PO	SP.GR.	HH	VD	IBS	BC
B0172-15	643	694	93	1	19	74	6	1.084	25	0	1	0/40
CASTILE	642	684	94	5	48	45	2	1.078	4	0	0	0/40
AC80545-1	620	690	90	4	45	45	6	1.075	8	2	0	0/40
STEUBEN	602	619	97	1	53	45	2	1.080	4	0	0	0/40
B0202-4	584	630	93	6	74	18	1	1.078	11	0	0	0/28
B0257-12	556	582	96	4	64	31	1	1.078	9	0	0	0/40
S438	549	594	92	5	87	6	2	1.087	1	0	0	1/28
CHIEFTAIN	546	567	96	4	82	14	0	1.059	0	0	1	2/33
B0405-4	535	581	92	8	77	14	0	1.093	6	0	5	1/36
W887	491	509	96	2	60	36	1	1.093	3	0	1	0/40
SAGINAW GOLD	488	527	93	6	75	17	2	1.074	0	0	0	0/36
W842	469	514	91	8	80	11	0	1.093	5	0	1	4/36
NISKA	468	517	91	5	47	44	5	1.074	7	2	0	0/40
VIKING	435	461	95	2	60	35	3	1.066	0	0	0	0/40
W936	429	471	91	7	76	15	2	1.079	2	2	1	0/37
MS716-15	423	475	89	9	77	12	2	1.089	9	0	0	0/39
TRENT	400	437	91	7	85	7	1	1.100	2	0	1	1/27
MS401-7	388	431	89	8	82	7	3	1.086	6	0	0	0/15
NYE55-27	386	446	86	11	67	19	3	1.082	2	0	1	0/40
W760	378	406	93	4	76	17	2	1.096	2	0	0	0/39
MS401-2	377	412	91	5	60	32	3	1.082	4	0	0	0/39
B0257-3	375	423	88	12	83	5	0	1.082	9	0	0	0/40
SNOWDEN	363	439	82	17	79	3	1	1.082	0	0	0	0/11
W952	363	410	89	8	80	9	3	1.078	2	0	1	1/27
S440	363	428	84	15	81	3	1	1.094	4	0	0	0/11
MS402-7	323	341	95	5	69	26	0	1.071	2	0	1	0/40
KANONA	310	333	93	7	78	15	0	1.070	3	0	0	0/29
W845	291	390	74	26	70	4	0	1.091	2	0	0	0/11
B0175-21	288	394	71	7	63	8	21	1.084	2	0	0	0/18
DK RED NORLAND	288	335	86	12	86	0	2	1.054	0	0	0	0/ 0
NYE57-13	284	363	78	22	71	7	0	1.068	4	0	0	0/20
AVERAGE	441	487	90					1.081				
LSD (.05)	94	90						0.004				

*NUMBER OF DEFECTS/NUMBER OF OVERSIZE TUBERS CUT

PLANTED MAY 10, 1991

NEBRASKA CULTIVAR TRIALS - 1991
A. D. PAVLISTA

INTRODUCTION:

In 1991, two red, two russet and two white/chip trials were conducted including participation in the North Central Regional (NCR) trials. The red and russet trials were conducted at Bridgeport (West Nebraska Potato Shippers) and at Imperial (Frenchman Valley Produce). The white/chip trial was conducted at Alliance (Diamond Hill Farms) and at Scottsbluff (Panhandle Research and Extension Ctr.). Scottsbluff was also the site of the NCR trial.

PROTOCOL:

Trials were conducted on farms under center-pivot irrigation except for those at Scottsbluff which were irrigated with a rolling sprinkler line. Fertilization ranged from 120 to 140 lb/a nitrogen and from 60 to 90 lb/a phosphorous. At Imperial and Alliance, potassium was added, and, at Bridgeport and Imperial, sulfur was added. Seed pieces were cut and treated with mancozeb. Thimet was added at planting. Asana, Monitor and Bravo were applied as needed. The herbicides used were Sencor/Lexone, Dual, Eptam/Genep, and Poast depending on the grower. Vines were desiccated mechanically and, in some locations, Diquat was used. The trial design in all locations was randomized complete block with four replicates for each cultivar. Plots were single row (36 in) with 25 seed pieces (20 ft). Key dates are given in Table 1.

Table 1. Key dates of each trial in 1991.

	Bridgeport	Imperial	Alliance	Scottsbluff
planting (P)	4/23	4/16	5/22	5/10
emergence (E)	5/20	(5/17)	6/8	5/30
desiccation (D)	8/20	8/5	9/24	8/26
harvest (H)	8/28	8/8	9/25	9/16
days from P to H	127	114	126	129
days from E to D	92	(80)	108	88

() indicates estimated; NCR trials were at Scottsbluff.

RED TRIAL:
(Table 2)

The highest overall yield was at Imperial. Red LaSoda had the highest yield at both location. Red Cloud, to be released in 1992 (breeding line NE A143.70-2), and La 12-59 were the other cultivars which yielded above 300 cwt/a in both trials.

RUSSET TRIAL:
(Table 3)

The trial at Imperial had the highest mean yield. Ranger Russet had significantly higher yields, over 450 cwt/a, than any other cultivar at both locations. The specific gravity of Frontier Russet was above the mean at both locations. Note, Shepody, a white-skinned cultivar, was included in this trial because it is used for processing as a russet.

WHITE TRIAL:
(Table 4)

Yields were highest at Alliance. Monona had the highest yield at both locations. At Alliance, LaBelle and MS 700-70 also yielded above 400 cwt/a. Specific gravities at Alliance were highest for W 877 and MS 700-70. All cultivars had acceptable chip color after 2 to 3 months storage at 45 to 50 F. The two cultivars most prone to scab at the two locations were MS 401-1Y and W 887. Early blight at Scottsbluff was most prevalent in MN 12171-103, MN 13740, MS 401-1Y, and W 870.

3-YEAR MEAN:
(Table 5)

Red and russet trials were also conducted at Mitchell in 1989 and 1990, and at Imperial in 1990. The highest yield of red-skinned cultivars was Red LaSoda. The best red skin color was observed with Red Cloud. Among russet cultivars, Ranger Russet gave the highest yield while Century and Frontier gave the highest specific gravity. The white/chip trial was also conducted at Alliance and at Mitchell in 1989 and 1990. Atlantic gave the highest yield and specific gravity. The lightest chip color after 2 to 3 months was obtained from Snowden and the darkest chip color from MS 700-70.

NCR TRIAL:
(Table 6)

In 1991, 16 cultivars, red, russet and white-skinned, were submitted. In Nebraska, the trial was conducted at Scottsbluff. The general merit ratings were in descending order: 1 = La 12-59 (red), 2 = Red Pontiac, 3 = Norchip, 4 = Wisc 870 (white), and 5 = ND 1538-1Russ. Refer to earlier summary on North Central Regional Potato Trials.

ACKNOWLEDGEMENTS:

The assistance of Carl Gall and Larry Williams is greatly appreciated. I extend my appreciation to the growers who cooperated in the 1991 trials -- Jack Nielsen (Diamond Hill Farms), Tim May (Frenchman Valley Produce), and George Hansen (West Nebraska Potato Shippers).

Seed used in these trials were obtained from Richard Chase (Michigan St. U.), Dan Hammond (U. Maine), Robert Johanson (N. Dakota St. U.), Florian Lauer (U. Minnesota), Joe Pavcek (USDA/U. Idaho), Stan Peloquin (U. Wisconsin), Gene Shaver (Shaver Seed Farms), Jack Nielsen (Diamond Hill Farms), and Dale Moore (Western Potatoes).

Table 2. Yield and tuber quality of red-skinned potato cultivars, 1991.

cultivar:	yield, cwt/a: total	yield, cwt/a: A (1)	% total A (1)	specific gravity (2)	common scab (3)	rot (3)	vascular discolor (3)	hollow heart (3)	off- types (3)
Bridgeport:									
R. LaSoda	512	493	96	1.068	0	0	1	0	1
D.R. Norland	285	260	91	1.076	2	1	1	4	0
Red Cloud	329	310	94	1.060	0	0	3	1	2
Sangre	370	343	93	1.072	0	1	0	0	6
La 12-59	331	312	94	1.073	1	1	1	0	0
ND 1196-2R	218	185	84	1.075	0	2	1	1	2
NE 8206	285	264	93	1.069	0	1	0	0	1
mean:	333	310	92	1.070					
lsd 0.1:	63	64	4						
Imperial:									
R. LaSoda	481	458	95	1.066	0	1	3	0	1
D.R. Norland	337	310	92	1.058	0	3	1	0	0
Red Cloud	341	323	95	1.076	0	1	1	0	2
Sangre	325	298	92	1.060	0	3	1	0	2
La 12-59	343	314	92	1.076	0	6	0	0	0
ND 1196-2R	366	323	88	1.065	0	2	2	3	1
NE 8206	393	370	94	1.080	0	1	1	0	2
mean:	369	352	93	1.069					
lsd 0.1:	56	55	3						

(1) A = tubers greater than 1 7/8 inch in diameter.

(2) Specific gravity was based on two readings taken from a 4-replicate pooled sample.

(3) Tuber quality readings were taken as a % of a 100-tuber, 4-replicate pooled sample.

Table 3. Yield and tuber quality of russet-skinned potato cultivars, 1991.

cultivar:	yield, cwt/a: total	yield, cwt/a: A (1)	% total A (1)	specific gravity (2)	common scab (3)	rot (3)	vascular discolor (3)	hollow heart (3)	off- types (3)
Bridgeport:									
R. Burbank	298	264	88	1.084	0	0	1	0	3
Century R.	364	339	93	1.071	0	0	1	3	7
Frontier R.	308	279	90	1.075	0	0	1	0	3
Norgold R.	275	246	90	1.083	0	2	2	0	5
R. Norkotah	277	246	89	1.070	0	0	1	1	7
Ranger R.	483	462	96	1.069	0	0	1	1	0
Shepody	343	325	95	1.068	0	1	2	0	8
ND 1538-1Rus	347	320	92	1.070	0	0	1	2	3
ND 671-4Rus	244	214	88	1.073	0	0	1	1	6
mean:	327	299	91						
lsd 0.1:	69	57	3						
Imperial:									
R. Burbank	323	289	89	1.071	0	2	2	0	9
Century R.	377	327	87	1.081	0	3	2	0	5
Frontier R.	406	373	92	1.079	0	3	4	0	2
Norgold R.	441	416	94	1.071	1	0	2	0	2
R. Norkotah	364	318	88	1.071	0	1	1	0	1
Ranger R.	524	472	90	1.072	0	1	1	0	2
Shepody	262	241	92	1.070	0	3	3	0	8
ND 1538-1Rus	379	320	85	1.071	0	0	1	0	4
ND 671-4Rus	306	273	89	1.070	1	4	3	0	0
mean:	376	337	90	1.073					
lsd 0.1:	78	62	6						

(1) A = tubers greater than 1 7/8 inch in diameter.

(2) Specific gravity was based on two readings taken from a 4-replicate pooled sample.

(3) Tuber quality readings were taken as a % of a 100-tuber, 4-replicate pooled sample.

Table 4a. Yield and tuber quality of white-skinned potato cultivars at Alliance, 1991.

cultivar:	yield, cwt/a:	specific gravity	common scab	black scurf	common scab	black scurf
Alliance:	A (1)	(2)	(3)	(3)	(4)	(5)
Atlantic	335	1.090	57	17	1.00	1.00
LaBelle	410	1.087	70	27	1.50	0.75
Mainchip	246	1.085	52	15	1.25	0.75
Monona	433	1.069	80	37	1.50	1.00
Norchip	327	1.088	40	35	1.00	1.00
Shepody	325	1.079	65	65	1.50	1.50
Snowden	343	1.090	55	17	2.50	0.75
MN 12171-103	221	1.093	7	80	0.50	0.75
MN 13740	214	1.088	52	25	1.00	1.50
MS 401-1Y	256	1.096	85	15	2.25	1.00
MS 700-70	425	1.093	65	12	1.50	0.50
MS 716-15	379	1.100	68	7	1.50	0.50
NE 84106	248	1.081	60	12	1.50	0.50
W 842	254	1.095	25	67	1.00	1.00
W 856	275	1.098	60	25	1.25	1.00
W 870	321	1.093	47	22	1.50	1.25
W 877	229	1.106	65	17	1.50	0.75
W 887	277	1.095	85	42	2.00	1.50
mean:	302	1.090	58	30	1.43	0.94
lsd 0.1:	90	0.013	29	30	0.74	0.86

- (1) A = tubers greater than 1 7/8 inch in diameter.
(2) Specific gravity was based on two readings taken from each replicate.
(3) Tuber quality readings were taken as a % of a 50 tubers from each replicate.
(4) scab severity (5) black scurf severity
0 = none 0 = none
1 = surface; 1 = few colonies, local;
2 = shallow with raised rim; 2 = few colonies, scattered;
3 = shallow pit (< 1/4 in); 3 = some colonies;
4 = pitted (< 1/4 in). 4 = many colonies.

Table 4b. Yield and tuber quality of white-skinned potato cultivars at Scottsbluff, 1991.

cultivar:	yield, cwt/a: A (1)	specific gravity (2)	common scab (3)	common scab (4)	early blight (5)
Scottsbluff:					
Atlantic	258	1.093	60	2.75	0
LaBelle	219	1.090	72	3.00	1
Mainchip	268	1.088	22	0.75	1
Monona	323	1.070	50	1.75	0
Norchip	268	1.071	37	1.25	1
Shepody	192	1.078	55	1.75	1
Snowden	241	1.083	67	2.50	0
MN 12171-103	231	1.084	25	1.50	3
MN 13740	199	1.074	55	2.25	3
MS 401-1Y	248	1.096	85	3.75	3
MS 700-70	273	1.091	80	1.75	0
MS 716-15	296	1.089	70	2.75	0
NE 84106	217	1.069	60	1.75	1
W 842	228	1.084	70	2.50	1
W 856	204	1.084	65	1.75	0
W 870	236	1.093	50	1.25	3
W 877	173	1.091	77	3.50	1
W 887	169	1.081	85	2.75	1
mean:	235	1.085	60	2.18	
lsd 0.1:	46	0.009	20	1.10	

- (1) A = tubers greater than 1 7/8 inch in diameter.
 (2) Specific gravity was based on two readings taken from each replicate.
 (3) Tuber quality readings were taken as a % of a 50 tubers from each replicate.
 (4) scab severity (5) early blight severity
 0 = none
 1 = surface;
 2 = shallow with raised rim;
 3 = shallow pit (< 1/4 in);
 4 = pitted (< 1/4 in).

Table 5a. Three-year means potato cultivar trials, 1989-91.

RED Cultivars:	yield, cwt/a: tubers > 1 7/8 in	% total, tubers > 1 7/8 in	specific gravity
R. LaSoda	428	96	1.071
D.R. Norland	289	91	1.069
Red Cloud	327	95	1.075
Sangre	357	94	1.070
LA 12-59	335	94	1.081
NE 8206	342	93	1.081
mean:	346	94	1.075
lsd 0.1:	46	2	0.005

RUSSET Cultivars:	yield, cwt/a: tubers > 1 7/8 in	% total, tubers > 1 7/8 in	specific gravity
R. Burbank	280	90	1.074
Century	319	91	1.082
Frontier	323	91	1.082
Norgold	328	91	1.077
Norkotah	306	90	1.074
Ranger	462	93	1.071
Shepody	298	94	1.077
mean:	327	91	1.077
lsd 0.1:	55	3	0.00

WHITE Cultivars:	yield, cwt/a: tubers - A > 1 7/8 in	% total, tubers - A > 1 7/8 in	specific gravity	chip color Agtron FF10
Atlantic	391	95	1.093	57
LaBelle	377	96	1.083	58
Monona	360	95	1.071	58
Norchip	333	92	1.081	59
Snowden	332	94	1.089	64
MS 700-70	339	94	1.088	51
NE 84106	355	94	1.079	58
W 842	296	92	1.092	56
mean:	348	94	1.084	58
lsd 0.1:	56	3	0.003	8

Note: Chip colors were taken 2 to 3 months after storage at 45-50F. With the Agtron FF10, higher numbers indicate lighter chips.

Table 5b. Tuber and disease problems observed in 1989-91 trials.

RED Cultivars:	Comments:
R. LaSoda	over browns
D.R. Norland	over browns
Red Cloud	off type
Sangre	surface scab
LA 12-59	over browns
NE 8206	pink, surface scab, oblong
RUSSET Cultivars:	Comments:
Burbank	jelly end, off-type
Century	surface scab, thin skin
Frontier	
Norgold	early die, hollow heart
Norkotah	early die, jelly end
Ranger	
Shepody	
WHITE Cultivars:	Comments:
Atlantic	surface scab, hollow heart
LaBelle	surface scab
Monona	black scurf
Norchip	off-type, vascular discolor, black scurf
Snowden	surface scab
MS 700-70	
NE 84106	early blight
W 842	surface scab, black scurf

Table 6a. Summary of 1991 North Central Regional Trial.

Selection Number or Variety	mean yield cwt/a	mean percent tubers > 1 7/8 inch	mean % total solids	chip color Agtron FF10	early blight reading (1)
Norchip	316	88	19.7	61	5
Norgold Rus.	214	95	16.2	44	3
Norland	295	96	17.1	46	1
Red Pontiac	396	95	15.2	26	5
Rus. Burbank	250	87	14.1	54	5
LA 12-59	336	95	17.7	54	5
MN 12567	258	93	21.6	54	2
MN 12966	271	98	18.2	43	2
MN 13035	327	93	17.7	30	5
MS 401-1Y	259	91	20.9	54	3
MS 402-8	96	100	22.9	48	1
ND 1871-3R	231	93	13.9	30	5
ND 1538-1Rus	315	93	16.9	51	2
Wisc. 856	272	94	18.4	60	5
Wisc. 870	295	94	19.7	60	4
Wisc. 877	223	89	20.7	53	4
mean:	272	93	18.2	48	3.3

(1) Early blight: 1 - susceptible; 5 - highly resistant.

Table 6b. Summary of 1991 North Central Regional Trial.

Selection Number or Variety	most (1) typical scab area-type	% scabby tubers (2)(3)	% no external defects (2)	% no internal defects (2)	comments on defects and general notes
Norchip	T-1	23	67	96	
Norgold Rus.	0	0	61	95	
Norland	0	0	97	93	
Red Pontiac	T-1	13	84	92	good size
Rus. Burbank	0	0	79	97	many off-types
LA 12-59	T-1	3	93	96	best test red
MN 12567	T-1	26	66	92	
MN 12966	T-1	6	81	95	light red skin
MN 13035	T-1	45	65	91	
MS 401-1Y	T-2	92	8	94	
MS 402-8	T-1	9	78	92	
ND 1871-3R	T-1	51	47	97	short plants
ND 1538-1Rus	0	0	81	97	best russet
Wisc. 856	T-1	41	50	97	tall plants
Wisc. 870	T-2	43	48	96	best test chipper
Wisc. 877	1-2	36	51	96	
mean:		24	66	95	

(1) (A-T) Area: T-less than 1%; 1 - 10-20%; 2 - 21-40%; 3 - 41-60%; 4 - 61-80%; 5 - 81-100%; Type: 1. small, superficial; 2. larger, superficial; 3. larger, rough pustules; 4. larger pustules, shallow holes; 5. very large pustules, deep holes.

(2) Percentage of tubers in a 100-tuber pooled sample. (one from each replication).

(3) Includes all tubers with scab lesions whether merely surface, pitted or otherwise and regardless of area. Tubers with any amount of scab are counted in this category.

New York - Long Island

J. B. Sieczka, J. M. Kossowski, D. D. Moyer, and R. C. Neese

Introduction:

Experiments conducted in 1991 are part of an ongoing program evaluating promising golden nematode resistant and russet type potato clones under Long Island conditions. Forty-five potato clones were evaluated in replicated experiments conducted at the Long Island Horticultural Research Laboratory and at Corwith Farms, Water Mill, New York. Data were collected on total and marketable yields, size distribution, internal and external defects and general appearance of potato tubers.

An experiment designed to determine the effect of various cultural practices on Norwis tuber yield, size and appearance was established in 1991. The variables investigated were: spacing (8 vs. 12"), nitrogen fertilization (150 vs. 200 lbs/A), and seed size (1.0 vs. 1.5 vs. 2.0 oz).

Early:

The highest total and marketable yields were produced by Superior, NYE55-27 and NYE55-44 (Tables 2 and 3). The highest specific gravity was produced by B0257-3 and NYE55-44. NY79 and NYE55-44 had the best appearing tubers. Hollow heart and brown center were observed in Superior. Internal necrosis was a problem in Monona, AF845-11, NY79 and NYE55-27.

Main Season White-skinned Clones:

Allegany, Norwis, NYK255-6 and Castile produced significantly higher total yields than the standard Katahdin (Tables 4 and 5). B0174-11, B0174-16 and NYK255-6 had the highest specific gravity. B0610-6 and NY86 had the best appearance ratings. Norwis, B0234-8, NYK255-6 had more than 50% of the tubers cut affected by internal defects.

NE107 Main Season:

The highest total and marketable yields were produced by AF1060-2 (Tables 6 and 7). Tubers of this clone are small to medium in size. The lowest yield was produced by NYE57-13. Entries that out yielded the standard Katahdin were NYE11-45, NY78, B0178-34, Allegany, Atlantic, AF828-5, Kennebec, and NY84. NYE55-35 had the highest specific gravity. Internal defects were present in more than 50% of the tubers cut in the entries Atlantic and NYE57-13.

Water Mill:

Allegany produced the highest marketable yield (Tables 8 and 9). AF1060-2 produced the highest total yield but 27% of the tubers were smaller than 2 inches. The best appearing lines were NY86 and NYE11-45. Norwis had the most internal defects.

Russet-skinned Clones:	W1005Rus produced the highest total yield (Tables 10 and 11). Russet Burbank also produced a high total yield but had a great deal of misshapen tubers. W1005Rus and BelRus produced the highest specific gravity. All lines tested, except BelRus, had a high percentage of internal defects. B0473-6 was the best appearing clone and Russet Burbank was the worst.
Red-skinned Clones:	Chieftain produced the highest total and marketable yield (Tables 12 and 13). B0033-23 and B0616-1 had the highest specific gravity. B0033-23 was the best appearing clone. Chieftain had the most internal defects.
Observation Trial:	Data from a non-replicated trial on yield, appearance, specific gravity and internal defects of early selection clones and recently released varieties are presented in Table 14.
Norwis Size Reduction:	<p>Norwis total and two to four inch yields were not affected by seed spacing or nitrogen rate (Table 15). The eight inch spacing resulted in significantly more tubers/foot and smaller tubers than the 12 inch spacing. There were significantly more tubers/foot at the 150 lb N/A rate than at 200lb N/A. However, there was no significant difference in tuber size between fertilizer treatments.</p> <p>The major effect on yield, tuber number and size was due to seed size. The 1.0 oz. seed size produced significantly lower yields than the other two seed sizes. Mean tuber weight decreased and tuber number increased significantly as seed size increased. Large Norwis tubers are generally rougher in appearance than medium size tubers are. Scab affected tuber appearance of all the treatments in this experiment and no conclusion could be drawn on treatment effect. A high percentage of internal defects were present in all treatments.</p>
Storage Results:	After-cooking darkening and blackspot ratings for clones grown in 1990 are given in Table 16.
Acknowledgements:	Seed was provided by R. L. Plaisted, Cornell University; K.G. Haynes, USDA; G. A. Porter, University of Maine; Windy Mountain Farm, Lake Placid, N.Y.; and W. C. Mehlenbacher, Castile, N.Y. Special thanks are extended to the Corwith Brothers for providing the land and assistance in the establishment of the experiment on the South Fork and to John Babinski for the use of harvest equipment. The assistance of Bennett Orłowski, Rod Zeltmann, Mark Sisson, Sandi Mulvaney and Carole Morini is greatly appreciated.

Long Island Table 1. Tuber characteristics of potato clones grown on Long Island, N.Y.–1991.

CLONE	Table	Color	Texture	Shape	Depth	Eye Depth		Comments
						Lateral	Apical	
Allegany	4-9	Bu	SN	R	R	S	M-D	Sl Irr
Atlantic	6,7	Bu	N	R	R	S	D	Irr
BelRus	10,11	B	HR	L	SF	S	S	
Castile	4,5,8,9	W	S	O	MT	S	S	Sl Irr, Sl Sc
Chieftain	12,13	LR	S	O-R	SF	S	S	Sk
Hampton	4,5	W	S	R	R	S	S	L, Sl Irr, Sc
Hudson	4,5	W	RS	R	SF	S	M	L, Sl Irr, Sc
Katahdin	4-9	W	RS	R-O	SF	S	M	Sl Irr, Sc
Kennebec	6,7	W	S	O	SF	S	M	Irr, Kn
Monona	2,3	W	S	O-R	SF	M	M	
Norchip	2,3	W	S	R-O	MT	S	M	Irr, Kn
Norland	12,13	LR	RS	R	MT	M	M	Sp
Norwis	4,5,8,9	W	S	O-R	SF	M	D	Irr, Rg, Sl Y
Russet Burbank	10,11	B	MR	L	R	S	S	Ugly
Superior	2-5,8,9	Bu	SN-N	R-O	SF	M-D	M-D	Rg, Sp
AF 828-5	6-9	W	RS	O-R	MT	S	M	Sl Irr
AF 845-11	2,3,8,9	Bu	SN	R-O	MT	M	M	Irr, Sk, Sp
AF1060-2	6-9	W	RS	R	R	S	M	Irr, L, Some Sp, Sm
B0033-23	12,13	D-MR	SN	R	R	S	S	
B0174-11	4,5	W	RS	R	R	S	M	Sp!, Sc, Irr
B0174-16	4,5	W	S	R	R	S	M	Sc, Irr
B0178-34	6,7	W	RS	R-O	MT	S	M	Irr
B0234-8	4,5	Bu	RS	R	MT	M	M-D	Sc, Irr, Sp
B0257-3	2,3	W	RS	R-O	MT	M	M	Sc!
B0316-19	10,11	B	HR	L-O	SF	S	S	Sl Irr
B0473-6	10,11	W	S	R	R	S	S	Sp!, OK
B0610-2	4,5	Bu	SN	R	R	S	S	L
B0616-1	12,13	DR	SN	R	R	S	S	
B9922-11	9-11	B	HR	L-O	SF	S	S	Sl Irr
ND2224-5R	12,13	DR	S	R	R	S	S	Some Sc
ND671-4	10,11	B	HR	L	MT	S	S	Irr
NDT9-1068-11R	12,13	DR	S	R-O	MT	S	S	Sk!, Some Sc, Some Gray Flesh
NY78	6,7	W	SN	R-O	SF	S	S	
NY79	2,3	Bu	SN	R-O	R	M	M	Sl Sc, Soft ball-like
NY84	6-9	W	RS	R-O	SF	S	S	OK, Sl Y
NY86	4,5,8,9	Bu	RS	R-O	MT	S	S	Some Sp
NY87	4,5,8,9	W	RS	R-O	MT	S	M	Some Sc, DSE
NY88	4,5	W	RS	R	MT	S	S-M	L, DSE
NYE11-45	6-9	W	S	R-O	MT	S	S	Nice, Some L
NYE55-27	2,3	Bu	SN	R-O	MT	M	M	Sl Sc
NYE55-35	6,7	W	SN	R-O	R	S	M	Net Necrosis, Sl Irr
NYE55-44	2,3,8,9	Bu	SN	R-O	MT	S	S	
NYE57-13	6,7	W	S	R	MT	S	M	L, Sl Irr
NYK255-6	4,5	Bu	SN-N	R	R	S	M	DSE, Rg
W1005 Rus	10,11	B	MR	L	SF	S	S	Irr

COLOR: B=brown, Bu=buff, R=red, W=white. Modifiers: L=light, M=medium, D=dark.

TEXTURE: N=netted, R=russet, S=smooth. Modifiers: H=heavy, M=moderate, R=Relatively, S=Slightly.

SHAPE: L=long, O=oblong, R=round.

TUBER DEPTH: MT=medium thick, R=round, SF=slightly flattened.

EYE DEPTH: D=deep, M=moderate, S=shallow.

COMMENTS: DSE=deep stem end, Irr=irregular, Kn=knobs,

L=prominent lenticels, PE=pinkeye, Rg=Rough, Sc=scab, Sl=slightly, Sk=skinned, Sm=small, Sp=sprouts, Y=Yellow.

Long Island Table 2.

Yield, marketable yield, percentage of yield by grade, size distribution and specific gravity for early season white-skinned clones grown at Riverhead, N.Y. - 1991.

Clone	Total Yield cwt/A	Marketable Yield		Size Distribution (%)					Size Distribution			Specific Gravity
		cwt/A	percentage of standard	< 2"	2 to 2.5"		2.5 to 3.25"	3.25 to 4"	> 4"	2 to 4 in.		
					2 to 2.5"	2.5 to 3.25"				2 to 4 in.	4 in.	
Season-117 days												
Superior	452	425	100	6	27	67	0	0	94	67	78	
Monona	394	362	85	8	36	56	0	0	92	56	71	
Norchip	370	305	72	17	56	27	0	0	83	27	78	
AF845-11	398	370	87	7	29	64	0	0	93	64	77	
B0257-3	384	317	75	17	41	42	0	0	83	42	90	
NY79	383	372	87	2	11	78	8	0	97	87	69	
NYE55-27	434	400	94	8	33	59	0	0	92	59	88	
NYE55-44	421	400	94	4	23	70	2	1	95	72	83	
Waller-Duncan												
LSD (0.05)	(58)	(41)									(3)	

Long Island Table 3. Maturity, tuber shape, and internal and external defects, for early season white-skinned clones grown at Riverhead, N.Y. - 1991.

Clone	Season-117 days	Maturity on 7/31/91*	Tuber Data*		Tuber Defects (%)				Percentage						
			Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Other**	Hollow heart	Brown center	Internal Necrosis Sl. Mod. Sev.			
Superior		3	R-O	6	0	0	0	0	0	0	10	10	5	0	0
Monona		3	O-R	6	2	0	0	0	0	1	3	0	40	10	5
Norchip		4	R-O	7	4	0	4	0	0	0	0	5	10	3	0
AF0845-11		4	R-O	6	0	0	0	0	0	0	0	13	8	0	3
B0257-3		4	R-O	5	8	0	0	0	0	8	0	0	0	0	0
NY79		4	R-O	8	1	0	0	0	0	0	5	5	20	5	0
NYE55-27		3	R-O	7	1	1	0	0	0	0	0	3	13	5	0
NYE55-44		1	R-O	8	0	0	0	0	0	0	3	0	0	0	0

* See rating system outlined in the text.

** Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade. Mechanical defects, however, were not scored.

Long Island Table 4. Yield, marketable yield, percentage of yield by grade, size distribution and specific gravity for main season white-skinned clones grown at Riverhead, N.Y. - 1991.

Clone	Total Yield cwt/A	Marketable Yield		Size Distribution (%)						Size Distribution			Specific Gravity
		cwt/A	percentage of standard	<2"	2 to 2.5"		3.25" to 4"	>4"	2 to 4 in.	2.5 to 4 in.			
Season-155 days													
Katahdin	446	313	100	29	16	51	4	1	70	55	72		
Superior	486	423	135	13	16	69	2	0	87	71	74		
Allegany	549	484	154	12	16	70	2	0	88	72	76		
Castile	493	373	119	24	31	43	2	0	76	45	66		
Hampton	418	338	108	19	23	57	1	0	81	58	64		
Hudson	484	338	108	29	13	55	2	1	70	57	70		
Norwis	542	466	149	11	9	71	5	3	86	76	63		
B0174-11	385	271	86	29	14	56	1	0	71	56	81		
B0174-16	395	311	99	21	17	59	2	0	79	62	85		
B0234-8	437	318	101	22	7	59	7	5	73	66	76		
B0610-2	459	364	116	21	33	46	0	0	79	46	73		
NY86	341	276	88	18	21	55	4	1	81	60	62		
NY87	413	334	107	17	16	61	4	2	81	65	72		
NY88	311	233	74	25	28	47	0	0	75	47	75		
NYK255-6	538	474	151	11	12	72	4	1	88	76	81		
Waller-Duncan													
LSD (0.05)													
											(45)	(92)	(4)

Long Island Table 5.

Maturity, tuber shape, and internal and external defects for main season white-skinned clones grown at Riverhead, N.Y. - 1991.

Clone	Maturity on 8/27/91*	Tuber Data*		Tuber Defects (%)					Percentage				
		Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Other**	Hollow heart	Brown center	Internal Necrosis		
											Sl.	Mod. Sev.	
Season-155 days													
Katahdin	2	R-O	6	21	2	1	0	18	10	15	3	0	0
Superior	1	R-O	3	3	1	1	0	1	13	3	0	0	0
Allegany	3	R	6	3	0	2	0	1	0	5	0	0	0
Castile	2	O	6	6	1	4	0	1	3	3	5	0	0
Hampton	3	R	6	8	1	1	1	5	0	15	5	0	0
Hudson	2	R	6	20	1	1	0	18	3	15	0	3	0
Norwis	2	O-R	4	4	1	3	0	0	10	18	15	20	10
B0174-11	1	R	5	23	1	1	1	20	15	0	3	0	0
B0174-16	1	R	5	8	2	1	0	5	13	0	0	0	0
B0234-8	1	R	5	19	3	1	0	15	48	38	3	10	15
B0610-2	2	R	7	1	0	1	0	0	0	3	18	5	3
NY86	1	R-O	7	2	1	1	0	0	5	3	0	0	0
NY87	1	R-O	6	7	1	1	0	5	10	10	0	0	0
NY88	1	R	6	5	0	0	0	4	8	3	0	0	0
NYK255-6	2	R	5	4	2	2	0	0	30	5	8	13	63

* See rating system outlined in the text.

** Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade. Mechanical defects, however, were not scored.

Long Island Table 6. Yield, marketable yield, percentage of yield by grade, size distribution and specific gravity for NE107 main-season white-skinned clones grown at Riverhead, N.Y. - 1991.

Clone	Total Yield cwt/A	Marketable Yield		Size Distribution (%)					Size Distribution			Specific Gravity
		cwt/A	percentage of standard	<2"	2 to 2.5"		3.25" to 4"	>4"	2 to 2.5 in.			
					2.5"	3.25"			4 in.	4 in.		
Season--155 days												
Katahdin	506	453	100	10	11	73	6	1	90	79	65	
Allegany	582	534	118	8	9	76	6	0	92	82	78	
Atlantic	572	501	111	10	10	72	6	3	88	78	76	
Kennebec	546	429	95	21	15	61	3	0	79	64	71	
AF0828-5	573	467	103	18	10	66	6	1	82	72	61	
AF1060-2	761	610	135	20	22	57	1	0	80	58	62	
B0178-34	587	493	109	14	14	67	3	2	84	70	74	
NY78	596	519	114	13	16	69	2	0	87	71	62	
NY84	544	460	101	14	18	65	2	1	84	66	58	
NYE11-45	602	518	114	14	22	62	3	0	86	64	58	
NYE55-35	495	443	98	11	18	69	3	0	89	71	83	
NYE57-13	402	320	71	20	24	55	1	0	80	56	69	
Waller-Duncan												
LSD (0.05)	(58)	(54)									(3)	

Long Island Table 7. Maturity, tuber shape, and internal and external defects, for NE107 main season white-skinned clones grown at Riverhead, N.Y. - 1991.

Clone	Maturity on 8/27/91*	Tuber Data*		Tuber Defects (%)					Percentage				
		Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Other**	Hollow heart	Brown center	Internal Necrosis		
											Sl.	Mod. Sev.	
Season-155 days													
Katahdin	3	R-O	6	3	3	0	0	0	5	3	5	3	0
Allegany	5	R	6	3	1	1	0	1	0	0	0	0	0
Atlantic	2	R	6	4	1	2	0	0	10	10	8	15	53
Kennebec	2	O	4	14	4	8	1	1	10	3	0	0	0
AF0828-5	3	O-R	5	11	3	7	0	1	3	0	0	0	0
AF1060-2	3	R	6	6	1	3	0	1	0	0	3	3	0
B0178-34	4	R-O	5	5	2	2	1	0	13	13	5	5	0
NY78	3	R-O	8	2	1	1	0	0	3	0	13	20	0
NY84	3	R-O	8	3	1	1	0	1	0	3	3	0	0
NYE11-45	2	R-O	8	2	1	1	0	0	8	5	8	3	3
NYE55-35	3	R-O	7	2	2	1	0	0	0	0	13	13	13
NYE57-13	1	R	7	3	2	1	0	1	50	0	0	0	0

* See rating system outlined in the text.

** Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade. Mechanical defects, however, were not scored.

Long Island Table 8. Yield, marketable yield, percentage of yield by grade, and size distribution for clones grown at Water Mill, N.Y. - 1991.

Clone	Total Yield cwt/A	Marketable Yield		Size Distribution (%)		
		cwt/A	percentage of standard	< 2"	2 to 4 in.	> 4"
Season-137 days						
Katahdin	406	325	100	18	82	0
Allegany	490	413	127	13	86	1
Castile	401	341	105	11	89	0
Norwis	391	348	107	7	93	0
Superior	354	300	92	13	87	0
AF 828-5	416	327	101	16	84	0
AF 845-11	367	308	95	12	87	1
AF1060-2	494	339	104	27	73	0
B9922-11	334	291	90	7	93	0
NY84	369	297	91	18	82	0
NY86	317	245	75	17	83	0
NY87	380	312	96	15	85	0
NYE11-45	401	319	98	18	82	0
NYE55-44	344	303	93	9	91	0
Waller-Duncan						
LSD (0.05)	(70)	(84)				

Long Island Table 2.

Tuber shape and internal and external defects for clones grown at Water Mill, N.Y. - 1991.

Clone	Tuber Data*		Tuber Defects (%)				Percentage		
	Shape	Appearance	Total	Sun- burn	Mis- shapen	Growth cracks	Other**	Hollow Brown heart center	Internal Necrosis Sl. Mod. Sev.
Season-137 days									
Katahdin	R-O	7	2	1	1	0	0	0	0
Allegany	R	7	2	2	0	0	0	0	0
Castile	O	7	4	4	0	0	0	0	0
Norwis	O-R	6	4	4	0	0	0	13	17
Superior	R-O	5	2	2	0	0	0	3	7
AF 828-5	O-R	7	5	5	0	0	0	7	0
AF 845-11	R-O	6	3	3	0	0	0	3	7
AF1060-2	R	7	4	3	1	0	0	0	3
B9922-11	L-O	7	6	6	0	0	0	7	0
NY84	R-O	7	2	1	0	0	0	3	0
NY86	R-O	8	6	6	0	0	0	0	3
NY87	R-O	7	3	3	0	0	0	3	7
NYE11-45	R-O	8	3	3	0	0	0	3	7
NYE55-44	R-O	7	3	3	1	0	0	3	0

* See rating system outlined in the text.

** Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade. Mechanical defects, however, were not scored.

Long Island Table 10.

Yield, marketable yield, percentage of yield by grade, size distribution and specific gravity for russet-skinned clones grown at Riverhead, N.Y. - 1991.

Clone	Total Yield cwt/A	Marketable Yield		Size Distribution (%)						Size Distribution			
		cwt/A	percentage of standard	< 4	4 to 8		8 to 12		12 to over		4 to 16 oz.		Specific Gravity
					8	12	12	16	> 16 oz.	16 oz.	16 oz.		
Season-155 days													
BelRus	309	198	100	35	42	17	5	1		64	23	74	
Russet Burbank	495	276	140	42	30	20	6	2		56	26	77	
B0316-19	442	300	152	25	30	25	12	7		68	37	71	
B0473-6	448	280	141	38	53	9	1	0		62	10	69	
B9922-11	451	349	176	15	28	31	18	8		77	49	73	
ND671-4	392	258	130	34	44	17	5	0		66	22	64	
W1005 Rus	617	433	219	29	39	26	5	1		70	31	79	
Waller-Duncan													
LSD (0.05)	(37)	(54)										(5)	

Long Island Table 11. Maturity, tuber shape, and internal and external defects, for russet-skinned clones grown at Riverhead, N.Y. - 1991.

Clone	Maturity on 8/27/91*	Tuber Data*		Tuber Defects (%)					Percentage				
		Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Other**	Hollow heart	Brown center	Internal Necrosis Sl. Mod. Sev.		
Season-155 days													
BelRus	1	L	7	5	1	0	0	3	5	5	3	0	0
Russet Burbank	4	L	3	25	1	23	0	0	10	5	8	8	8
B0316-19	1	L-O	6	12	5	4	3	0	10	23	25	8	0
B0473-6	3	R	8	3	1	2	0	0	13	5	8	0	8
B9922-11	2	L-O	6	7	1	3	3	0	30	3	3	0	3
ND671-4	2	L	6	4	0	2	2	0	23	0	8	8	5
W1005 Rus	3	L	5	10	1	10	0	0	8	0	15	0	0

* See rating system outlined in the text.

** Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade. Mechanical defects, however, were not scored.

Long Island Table 12. Yield, marketable yield, percentage of yield by grade, size distribution and specific gravity for red-skinned clones grown at Riverhead, N.Y. - 1991.

Clone	Total Yield cwt/A	Marketable Yield		Size Distribution (%)					Size Distribution			Specific Gravity
		cwt/A	percentage of standard	< 2"	2 to 2.5"	2.5 to 3.25"	3.25 to 4"	> 4"	2 to 4 in.	2.5 to 4 in.		
Season-155 days												
Chieftain	519	444	100	14	20	65	0	0	86	65	59	
Norland	279	206	46	26	32	41	1	0	74	42	62	
B0033-23	351	296	67	16	36	48	0	0	84	48	67	
B0616-1	299	240	54	20	32	48	0	0	80	48	68	
ND2224-5R	346	270	61	22	25	53	1	0	78	53	59	
NDT9-1068-11R	372	259	58	30	23	47	0	0	70	47	58	
Waller-Duncan												
LSD (0.05)	(30)	(37)									(2)	

Long Island Table 13. Maturity, tuber shape, and internal and external defects, for red-skinned clones grown at Riverhead, N.Y. - 1991.

Clone	Maturity on 8/27/91*	Tuber Data*		Tuber Defects (%)					Percentage				
		Shape	Appear- ance	Total	Sun-		Mis- shapen	Growth cracks	Other**	Hollow heart	Brown center	Internal Necrosis	
					burn	Other**							
Season-155 days													
Chieftain	2	O-R	7	3	2	0	0	0	0	0	13	15	3
Norland	1	R	6	4	1	2	1	0	0	10	0	0	0
B0033-23	1	R	8	2	1	0	1	0	0	0	0	0	0
B0616-1	1	R	7	2	1	1	0	0	0	0	0	3	0
ND2224-5R	1	R	7	8	1	1	0	6	0	0	3	0	0
NDT9-1068-11R	5	R-O	7	15	1	3	2	9	0	0	3	3	0

* See rating system outlined in the text.

** Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade. Mechanical defects, however, were not scored.

Long Island Table 14. Yield and quality of early selection lines and recently named varieties in a non-replicated observation trial - 1991.

Clone	Yield (cwt/A)		% Defects	Specific Gravity	Internal Defects										Color	Texture	Shape	Depth	Eye Depth		Appearance	Comments
					HH	BC	Internal			Necrosis			SL	M					S	Lateral		
	Total	2 to 4"					HH	BC	SL	M	S											
Katahdin	420	363	3	68	2	0	1	0	0	0	W	S	R-O	SF	S	M	7	Sb				
Superior	406	360	3	69	2	0	1	0	0	0	Bu	SN	O-R	SF	D	D	5	Irr				
Chieftain	428	380	3	61	0	1	2	0	0	0	LR	S	R-O	MT	S	M	7	Sb, Sk				
B9922-11	339	294	8	70	4	0	1	1	0	0	B	HR	L-O	MT	S	S	7	Mis, GC				
All Blue	298	98	2	69	0	0	0	0	0	0	Bl	RS	O	R	M	M	6	Sm				
Blue Mac	363	163	7	63	0	0	2	2	0	0	L Pu	RS	R	MT	M	M	6	Sm				
Calgold	507	448	5	66	4	0	0	0	0	0	W	RS	O-R	MT	M	M	5	Irr				
Dark Red Norland	306	248	1	59	0	0	1	1	0	0	D R	S	R-O	MT	S	M	7	Sp				
Eide Russet	484	368	1	63	0	0	0	0	0	0	B	MR	L	R	S	S	7	Vari size				
Michigold	433	397	1	71	0	0	0	0	0	0	Bu	N	R	R	M	M	6	Sl Irr				
B0257-9	338	295	3	79	4	0	0	0	0	0	Bu	SN	R-O	R	M	D	4	Irr, Scurf				
B0493-8	407	367	2	64	1	0	0	0	0	0	B	HR	O-L	MT	S	S	6	Mis, Sl Irr				
B0582-1	453	342	17	70	9	0	0	0	0	0	Bu	SN	O-R	MT	S	M	6	L				
B0585-5	393	362	4	67	7	0	0	0	0	0	Bu	N	R	R	S	M	7	Sb				
B0586-3	470	438	2	78	0	0	2	0	0	0	Bu	SN	R	R	M	M	6	Sb				
B0587-9	455	414	3	76	1	0	2	0	0	0	Bu	SN	R	R	S	M	7	Sb				
B0615-1	321	248	2	65	0	1	1	0	0	0	MR	S	R	R	S	S	7	Sm				
J52-11	333	303	1	69	1	0	0	0	0	0	Bu	RS	R-O	SF	S	M	4	Irr, Mis				
J52-16	333	275	1	71	0	0	0	0	0	0	Bu	SN	R-O	MT	S	M	6	Sb				
J52-23	398	351	1	59	1	1	2	0	0	0	Bu	N	R	R	S	VD	4	Sp				
J84-4	256	223	0	71	0	1	0	0	0	0	Bu	SN	R	R	S	M	7					
J84-8	463	383	6	74	1	1	1	1	0	0	Bu	N	O	SF	S	M	4	Irr				
J84-12	492	434	1	83	0	0	0	1	2	0	Bu	N	R	R	S	S	7					
J84-16	492	446	1	88	0	1	2	1	0	0	Bu	N	O	MT	S	S	7	Sb,				
Entries with poor yield and/or appearance																						
Banana											Y							All culls				
Tejon											W	S	O	SF	S	S	4	Irr				
B0032-40											MR	S	R	R	S	S	8	Sm				
B0329-10											T	LR	O	MT	S	S	6	Irr				
B0386-9											Bu	SN	R-O	MT	M	D	4	Irr, Kn				
B0405-6											W	S	R	R	S	S	7	Sm				
B0564-12											Bu	SN	R	R	S	S	8	Marg. size				
B0591-5											W	RS	O-R	MT	S	S	6	GC				
B0615-2											LR	0	0	0	0	0	8	Sm				
B0616-4											P	S	R	R	S	S	8	Sm				
J52-2											Bu	SN	R	R	S	S	6	Sm				
J52-45											W	RS	R	R	S	M	7	Sm, Irr				

*Katahdin and Superior were replicated six times and there were four replicates of Chieftain and B9922-11. All other entries were not replicated. Abbreviations not listed in Table 1 are: Bl = blue, GC = growth cracks, M = misshapen, P = pink, Pu = purple, S = sunburn, T = tan, Y = yellow. Internal defects = number/10 tubers cut.

Long Island Table 15.

The effect of spacing, N rate and seed size on yield, size distribution, mean tuber weight, tubers per foot and internal defects of 'Norwis' grown at Riverhead, N.Y. - 1991.

foot and internal defects of "Norwis" grown at Kivireau, N. I. - 1921.															
Seed Spacing (inch)	N rate (lbs/A)	Seed Size (oz.)	Yield (cwt/A)					Mean Tuber		Percentage					
			Total	2-4"	< 2"	2 to 2.5"	2.5 to 3.25"	3.25 to 4"	> 4"	Tuber Wt. (oz)	per Foot	Hollow heart	Internal Necrosis Sl. Mod. Sev.		
Season - 150 days.															
8	150	1.0	435	406	27	53	345	6	3	6.2	7.3	30	10	3	3
		1.5	488	460	28	67	382	12	0	6.0	8.6	25	18	0	3
		2.0	461	425	35	67	350	9	0	5.5	8.7	18	13	10	0
8	200	1.0	430	403	22	40	335	28	5	6.8	6.6	13	10	10	0
		1.5	448	420	20	47	355	19	8	6.8	7.0	30	13	5	0
		2.0	462	430	29	56	369	6	4	5.9	8.2	25	25	5	0
12	150	1.0	423	397	14	25	349	23	13	8.0	5.5	18	15	0	3
		1.5	424	389	27	41	323	25	8	6.7	6.6	35	15	15	0
		2.0	457	424	30	38	379	7	4	6.7	7.1	30	10	10	3
12	200	1.0	428	398	25	29	323	46	4	7.8	5.8	18	28	3	0
		1.5	449	424	16	32	370	22	9	7.4	6.4	30	13	8	0
		2.0	472	440	28	36	390	15	4	6.6	7.5	15	15	8	0
MAIN EFFECTS															
Spacing															
8"			454a	424a	27a	55a	356a	13a	3a	6.2a	7.7b				
12"			442a	413a	23a	34b	356a	23a	7a	7.2b	6.5a				
N Rate															
150			448a	418a	27a	49a	355a	14a	5a	6.5a	7.3a				
200			448a	420a	23a	40a	357a	23a	6a	6.9a	6.9a				
Seed Size															
1.0			429a	402a	22a	37a	329a	26b	3a	7.2c	6.3a				
1.5			453b	424b	23a	47b	357ab	20ab	6a	6.7b	7.1b				
2.0			464b	430b	31b	49b	372b	9a	6a	6.2a	7.8c				

Means followed by the same letter in each main effect are not significantly different from each other according to Fisher's Protected LSD (0.05)

Long Island Table 16. After-cooking darkening and blackspot ratings of clones grown in 1990.

Main-season- White		Advanced- White		Red-skinned		USDA - Russet		NE107 - Russet	
1990 Tables 4-5		1990 Tables 6-7		1990 Tables 12-13		1990 Tables 16-17		1990 Tables 14-15	
Clone	ACD BS	Clone	ACD BS	Clone	ACD BS	Clone	ACD BS	Clone	ACD BS
Katahdin	4.8 6.0	Katahdin	4.8 5.9	Chieftain	4.9 6.0	BelRus	5.0 5.9	Russet Burbank	5.0 5.7
Allegany	4.9 5.8	Superior	4.8 5.8	Cherry Red	4.4 6.0	NemaRus	3.7 5.9	BelRus	4.9 5.9
Atlantic	4.7 6.0	NorWis	4.9 6.0	LaRouge	4.8 6.0	B0012-7	3.7 5.8	Coastal Russet	4.5 5.9
Hudson	4.7 5.7	B0233-1	4.9 5.8	Norland	4.0 6.0	B0312-10	3.7 5.9	HiLite Russet	4.9 6.0
Kennebec	4.9 6.0	B0257-12	3.4 6.0	Purple 4	3.9 5.9	B0324-5	2.2 5.9	Russet Norkotah	4.8 5.9
AF828-5	4.7 5.9	B0622-2	4.7 6.0	Purple 5	4.0 5.9	B0425-5	3.4 5.9	A74114-4	4.5 6.0
AF1060-2	4.7 5.9	NY78	4.5 5.9	Red Cloud	4.9 6.0	B9922-11	4.8 6.0	B0220-14	4.5 5.1
B9935-10	4.9 5.9	NY84	4.7 5.9	Reddale	4.7 5.7	B9932-50	4.8 6.0	ND671-4	4.8 6.0
E57-13	4.1 6.0	E11-45	4.4 6.0	Redsen	3.7 6.0	F143-1	3.8 5.9	Fisher's Protected	
F77087	5.0 5.9	E55-27	3.9 5.9	Sangre	4.9 6.0			LSD (0.05)	(0.3) (0.2)
LA01-38	4.5 5.2	E55-44	4.7 5.9	B0033-23	4.7 6.0				
NY78	4.7 5.8	E57-13	4.2 6.0	B0615-1	4.6 6.0				
NY84	4.9 5.8	G76-29	4.6 6.0	B0615-2	4.8 6.0				
		G76-31	5.0 6.0	B0616-1	4.3 6.0				
		G77-1	4.9 6.0	LA12-59	4.6 6.0				
				ND 2224-5R	4.6 6.0				
				NDT9-1068-11R	4.8 5.9				
Fisher's Protected									
LSD (0.05)	(0.3) (0.2)			(0.3) (0.1)	(0.4) (ns)	(0.5) (ns)		(0.3) (0.2)	

After-cooking darkening (ACD) ratings based on a scale of 1 to 5; 1 = severe darkening, 5 = no after-cooking darkening. Five tubers rated per replicator four replications in each experiment.

Blackspot (BS) determinations are based on approximately ten tubers per replication. Tubers were stored at 40 F and bruised between 2/7/90 and 3/2/90. Bruised areas were peeled and evaluated two days after impact. Each tuber received a blow in each of two locations about 1 to 2 cm from the stem end. The bruising was done by dropping a 100 gram weight a distance of 30 cm. The point of impact was marked by inking the base of the weight. Ratings are based on a scale of 1 to 6 with 1 = severe discoloration and 6 = no discoloration.

NEW YORK - UPSTATE

D. E. Halseth, W. L. Hymes and R. W. Porter

Program Scope

The Vegetable Crops Department, Cornell University, conducted potato variety yield trials in five counties in upstate New York in 1991 in which a total of twenty-one named and ninety-two numbered clones were evaluated. Six replicated variety yield trials were conducted at the Thompson Vegetable Research Farm at Freeville in Tompkins County on a Howard gravelly loam (Tables 1-12). Grower trials (not reported here) were conducted on mineral soils Cayuga, Steuben and Wyoming Counties and on muck soils in Cayuga and Wayne Counties. As evaluation of potato lines with golden nematode (GN) resistance is one of our program's highest priorities, 24% of the named and 73% of the numbered entries in our trials have resistance. Marketable yield, tuber quality and appearance, maturity, storage life and processing potential are among the important characteristics which are evaluated. Additional information on grower trials, variety x nitrogen fertilization, storage and chipping research can be obtained from the authors.

Research Farm

Seventy of the entries mentioned above were evaluated in randomized complete block plots which were replicated four times at Freeville. These experiments were planted at 9" spacing on a 34" bed with 1150 lbs/A of 13-13-13 applied in bands at planting on a Howard gravelly loam soil. Weed control consisted of Lorox DF at 3 lb/A preemergence on May 11 and Lexone DF at 0.25 lb/A postemergence on July 3. Insect control utilized applications of Ambush 2E, Asanax XL, PBO-8 (piperonyl butoxide), Thiodan 3EC and Vydate L. Disease control of foliar pathogens used Bravo 720, Dithane F-45, Manzate 200 and Super-tin 4L. Hilling was accomplished during July 1-3 and vine kill used Evik 80WP 3 lbs/A + crop oil 2 qt/A [kill dates on tables].

Seasonal Observations

Problems encountered in 1991 were primarily associated with very dry and hot conditions during planting through mid growing season and variable rainfall after that. Plants were subjected to significant drought stress and our irrigation could not keep up with water needs. Misshapen, growth cracks, hollow heart and heat necrosis were the most common tuber defects. Yields and specific gravity were average when compared to other seasons. Early blight was not a problem, but Rhizoctonia, scab and silver scurf were observed on many lines.

Promising Entries

Replicated variety yield trial data from 1991 experiments grown at Freeville, NY, are presented in tables 1 through 12. In the early maturity yield trial the seven lines tested did not equal Superior or Norchip in total or marketable yield. The medium trial had three entries (AF875-16, J84-12 and NY95) with specific gravity equal to or above Atlantic. E55-44 was the best in appearance while NY84 had the highest yield (but also the lowest specific gravity). In the medium-late trial AF1060-2, AF828-5 and E11-45 had yields above Atlantic. NY88, E11-45 and AF1060-2 had very good appearance, B0241-8 had excessive hollow heart and B0175-21 was riddled with growth cracks. In the late trial Allegany and Steuben had higher total yields than Katahdin. B0178-34 had higher specific gravity than Atlantic while Castile, K257-1 and NY78 had the best appearance. The russet trial indicated that Russet Norkotah and W1005 had higher marketable yield than Russet Burbank. In the USDA breeding clone trial B0180-24 and B0202-4 had higher marketable yield than Atlantic and only B0174-16 had higher specific gravity.

Table Headings Explanation

Marketable yield in hundredweight per acre (cwt/a) was calculated from total yield less both external defects and undersize tubers (smaller than 1 7/8 inches).

Percent marketable yield represents the percentage that each entry's marketable yield is of that of a specified standard variety for that trial.

Size distribution percentage is the weight of a specific size category divided by total yield (including defects).

Specific gravity was determined by potato hydrometer.

Vine maturity ratings were on a nine point scale:

- 1 = all plants completely dead (very early maturity)
- 9 = all plants full green (very late maturity)

Tuber shape was classified using the code:

- | | | |
|------------------|-----------------|-----------------|
| 1. round | 2. mostly round | 3. rd. to obl. |
| 4. mostly oblong | 5. oblong | 6. obl. to long |
| 7. mostly long | 8. long | 9. cylindrical |

Tuber appearance was subjectively evaluated using the scale:

- 1 = extremely rough or otherwise unattractive
- 9 = very uniform and attractive

External defects were rated on all material graded, internal defects were made on a subset of tubers, usually 10 per replication, taken from size categories 3 and 4.

Upstate New York Table 1. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for the early maturity trial grown at Freeville, New York - 1991.

Variety/Clone	Total Yield cwt/A	Marketable Yield percentage of std. cwt/A	Size Distribution by Class (%) ¹					Size Distribution(%)		Spec. Grav.	
			1	2	3	4	5	1-7/8 to 4 in.	2-1/2 to 4 in.		
B0257-3	232	191	75	16	38	44	2	0	84	46	87
H51-9	264	234	92	11	22	60	7	0	89	67	73
H51-43	220	186	73	10	24	56	9	1	89	65	76
J52-2	182	137	54	18	37	39	6	0	82	45	70
J52-11	217	188	74	8	22	62	8	0	92	70	72
J52-45	206	170	67	13	37	45	5	0	87	50	70
Norchip	310	264	103	11	28	54	7	0	89	61	80
NY90 (H51-19)	232	203	80	10	34	51	5	0	90	56	81
Superior (std)	272	255	100	4	17	64	14	1	95	78	75
Waller-Duncan LSD (k=100)	26	27									3
C.V. (%)	(8)	(10)									(3)

¹Size classes: 1 = 1-1/2 to 1-7/8"; 2 = 1-7/8 to 2-1/2"; 3 = 2-1/2 to 3-1/4"; 4 = 3-1/4 to 4"; 5 = over 4"

Plant date: May 2

Vine-kill date (mowed): August 22

Harvest date: August 22

Upstate New York Table 2. Plant maturity, tuber shape and appearance, external and internal tuber defects for the early maturity trial grown at Freeville, New York - 1991.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)					Int. Tuber Defects (%) ²		
		Shape	Appear.	Total	Sun- burn	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
B0257-3	3.5	1.8	6.9	2.6	0.1	1.1	0.3	1.1	0.0	0.0	0.0
H51-9	3.3	2.0	6.6	0.5	0.0	0.2	0.3	0.0	0.0	0.0	0.0
H51-43	3.0	2.8	7.0	4.6	0.2	0.5	3.0	0.9	10.0	0.0	0.0
J52-2	3.3	1.8	6.5	7.4	0.0	0.0	6.8	0.6	0.0	0.0	0.0
J52-11	4.0	2.0	5.8	5.1	0.5	0.6	3.3	0.7	0.0	0.0	0.0
J52-45	3.0	2.0	5.8	4.9	0.5	0.0	2.6	1.8	0.0	5.0	0.0
Norchip	4.5	2.5	4.4	4.3	0.7	1.9	1.5	0.2	0.0	0.0	0.0
NY90 (H51-19)	3.5	1.0	7.4	2.6	0.4	0.0	2.2	0.0	0.0	0.0	0.0
Superior (std)	3.3	3.0	4.8	1.4	0.1	0.7	0.2	0.4	2.5	0.0	2.5

¹See the standard NE107 rating system for a key to these ratings, in the appendix to this report.

²Based on a 10-tuber sample from each of 4 replications. The tubers were taken from size categories 3 and 4.

Upstate New York Table 3. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for the medium maturity trial grown at Freeville, New York - 1991.

Variety/Clone	Total Yield cwt/A	Marketable Yield percentage of std.	Size Distribution by Class (%) ¹					Size Distribution(%)		Spec. Grav.
			1	2	3	4	5	1-7/8 to 4 in.	2-1/2 to 4 in.	
Atlantic	275	245	5	15	53	25	2	93	78	93
AF875-16	203	174	10	32	49	9	0	90	58	94
E55-27	259	220	12	33	49	5	1	87	54	86
E55-35	220	197	6	23	54	17	0	94	71	90
E55-44	210	181	9	32	50	9	0	91	59	83
E57-13	283	253	10	24	53	13	0	90	66	78
F77087	253	224	8	16	55	21	0	92	76	86
J52-16	179	157	9	23	43	24	1	90	67	76
J52-23	227	206	6	13	51	30	0	94	81	69
J84-12	203	170	14	42	39	5	0	86	44	93
Katahdin (std)	312	264	6	16	50	27	1	93	77	80
Monona	269	249	5	21	53	20	1	94	73	75
NY84	313	277	8	14	46	32	0	92	78	68
NY93 (J84-4)	227	201	5	22	54	19	0	95	73	85
NY95 (J84-16)	249	213	9	26	47	16	2	89	63	95
Waller/Duncan										
LSD (k=100)	52	53								3
C.V. (%)	(15)	(17)								(3)

¹Size classes: 1 = 1-1/2 to 1-7/8"; 2 = 1-7/8 to 2-1/2"; 3 = 2-1/2 to 3-1/4"; 4 = 3-1/4 to 4"; 5 = over 4"

Plant date: May 3

Vine-kill date: August 30

Harvest date: September 9

Upstate New York Table 4. Plant maturity, tuber shape and appearance, external and internal tuber defects for the medium maturity trial grown at Freeville, New York - 1991.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)					Int. Tuber Defects (%) ²		
		Shape	Appear.	Total	Sun- burn	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
Atlantic AF875-16	3.0	1.0	5.8	4.0	0.4	1.0	1.2	1.4	15.0	5.0	5.0
	1.5	2.0	6.3	4.6	1.4	0.6	2.4	0.2	10.0	0.0	0.0
E55-27 E55-35	2.3	2.0	6.5	1.7	0.7	0.2	0.0	0.8	0.0	2.5	0.0
	3.8	1.0	7.1	3.2	1.3	0.5	0.0	1.4	0.0	2.5	2.5
E55-44 E57-13	1.3	2.0	7.4	4.6	0.0	1.4	1.7	1.5	0.0	0.0	0.0
	1.8	2.0	7.1	1.1	0.2	0.1	0.5	0.3	2.5	0.0	0.0
F77087 J52-16	3.0	3.0	6.0	3.9	1.3	0.9	0.7	1.0	5.0	2.5	0.0
	1.3	2.0	6.0	2.7	1.2	0.2	0.4	0.9	0.0	7.5	0.0
J52-23 J84-12	1.8	2.0	5.6	3.0	0.3	0.4	2.0	0.3	0.0	20.0	0.0
	2.8	2.0	6.9	2.7	0.3	0.0	0.5	1.9	0.0	0.0	0.0
Katahdin (std) Monona	4.5	2.0	6.0	9.1	4.1	1.1	0.8	3.1	22.5	2.5	0.0
	2.0	3.0	5.0	1.3	0.7	0.2	0.0	0.4	2.5	5.0	0.0
NY84 NY93 (J84-4)	2.3	2.0	6.0	4.1	1.0	0.7	0.8	1.6	0.0	5.0	0.0
	1.5	2.0	6.1	5.6	0.0	0.6	1.7	3.3	15.0	5.0	0.0
NY95 (J84-16)	2.5	3.0	5.8	3.1	0.4	2.4	0.0	0.3	0.0	0.0	0.0

¹See the standard NE107 rating system for a key to these ratings, in the appendix to this report.

²Based on a 10-tuber sample from each of 4 replications. The tubers were taken from size categories 3 and 4.

Upstate New York Table 5. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for the medium-late maturity trial grown at Freeville, New York - 1991.

Variety/Clone	Total yield cwt/A	Marketable Yield percentage of std.	Size Distribution by Class (%) ¹					Size Distribution(%)		Spec. Grav.	
			1	2	3	4	5	1-7/8 to 4 in.	2-1/2 to 4 in.		
Atlantic (std)	314	285	100	3	11	55	30	1	96	85	94
AF828-5	373	327	115	3	12	50	30	5	92	80	78
AF1060-2	394	356	125	8	23	50	19	0	92	69	78
B0175-21	228	150	53	7	19	51	22	1	92	73	91
B0241-8	307	278	98	7	15	58	20	0	93	78	82
E11-45	366	333	117	5	19	59	15	2	93	74	71
H50-80	167	141	50	8	34	49	9	0	92	58	80
H51-7	230	206	72	8	31	53	8	0	92	61	77
Kanona	276	220	77	4	10	43	36	7	89	79	81
Katahdin	352	289	102	4	11	46	35	4	92	81	75
Kennebec	337	275	97	4	18	40	35	3	93	75	77
LaBelle	307	277	97	5	13	50	29	3	92	79	82
Monona	257	236	83	5	18	48	28	1	94	76	73
Norwis	328	299	105	3	11	56	28	2	95	84	76
NY87 (F24-12)	293	270	95	5	16	55	23	1	94	78	76
NY88 (G76-29)	266	239	84	6	23	52	17	2	92	69	83
NY89 (H26-2)	212	199	70	4	16	56	23	1	95	79	88
Snowden	282	250	88	9	28	53	10	0	91	63	90
Waller-Duncan LSD (k=100)	54	47									3
C.V. (%)	(14)	(14)									(3)

¹Size classes: 1 = 1-1/2 to 1-7/8"; 2 = 1-7/8 to 2-1/2"; 3 = 2-1/2 to 3-1/4"; 4 = 3-1/4 to 4"; 5 = over 4"

Upstate New York Table 6. Plant maturity, tuber shape and appearance, external and internal tuber defects for the medium-late maturity trial grown at Freeville, New York - 1991.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)					Int. Tuber Defects (%) ²					
		Shape	Appear.	Total	Sun- burn	Mis- shapen	Growth Cracks	Rot	Holl.		Int.			
									Heart	Vasc.				
Int. Nec.	Disc.	Vasc.	Heart	Rot	Growth	Cracks	Shapen	Mis-	Sun-	Total	Appear.	Shape	Mat. at	Vinekill
0.0	0.0	0.0	7.5	0.8	2.0	0.5	1.3	0.5	1.3	4.6	6.0	2.0	3.3	Atlantic (std)
0.0	0.0	0.0	0.0	0.1	1.0	0.8	2.5	0.8	2.5	4.4	6.3	3.0	4.8	AF828-5
0.0	0.0	0.0	0.0	0.4	0.9	0.8	0.1	0.8	0.1	2.2	6.8	2.0	3.8	AF1060-2
0.0	5.0	5.0	0.0	0.8	22.0	1.8	0.3	1.8	0.3	24.9	6.1	2.0	2.0	B0175-21
0.0	0.0	0.0	27.5	1.0	0.5	0.0	1.4	0.0	1.4	2.9	6.5	2.0	2.5	B0241-8
0.0	0.0	0.0	5.0	0.0	0.1	0.4	1.1	0.4	1.1	1.6	7.0	3.0	4.3	E11-45
0.0	2.5	2.5	0.0	0.6	4.1	0.5	1.5	0.5	1.5	6.7	6.5	2.0	1.0	H50-80
0.0	0.0	0.0	0.0	1.1	0.5	0.4	0.2	0.4	0.2	2.2	6.4	2.0	2.0	H51-7
0.0	10.0	10.0	0.0	6.0	1.0	0.3	2.1	0.3	2.1	9.4	5.9	2.0	4.3	Kanona
0.0	0.0	0.0	10.0	1.1	1.6	2.2	5.2	2.2	5.2	10.1	6.3	2.0	4.3	Katahdin
2.5	0.0	0.0	7.5	2.1	1.7	2.7	4.3	2.7	4.3	10.8	4.9	5.0	3.0	Kennebec
0.0	2.5	2.5	2.5	0.1	0.0	0.7	0.7	0.7	0.7	1.5	5.8	3.0	3.3	LaBelle
0.0	2.5	2.5	2.5	0.8	0.8	0.0	0.6	0.0	0.6	2.2	5.0	2.0	2.8	Monona
0.0	0.0	0.0	0.0	0.3	2.3	0.7	0.5	0.7	0.5	3.8	5.6	2.0	2.8	Norwis
0.0	0.0	0.0	5.0	0.5	0.5	0.4	0.6	0.4	0.6	2.0	6.1	1.3	2.3	NY87 (F24-12)
0.0	2.5	2.5	2.5	0.9	0.0	0.1	0.8	0.1	0.8	1.8	7.9	1.0	3.0	NY88 (G76-29)
0.0	0.0	0.0	10.0	0.4	0.0	0.2	0.0	0.2	0.0	1.1	6.4	1.0	3.3	NY89 (H26-2)
0.0	7.5	7.5	7.5	0.8	0.5	0.3	0.7	0.3	0.7	2.3	4.9	2.0	3.3	Snowden

¹See the standard NE107 rating system for a key to these ratings, in the appendix to this report.

²Based on a 10-tuber sample from each of 4 replications. The tubers were taken from size categories 3 and 4.

Upstate New York Table 7. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for the late maturity trial grown at Freeville, New York - 1991.

Variety/Clone	Total Yield cwt/A	Marketable Yield percentage of std.	Size Distribution by Class (%) ¹					Size Distribution(%)		Spec. Grav.
			1	2	3	4	5	1-7/8 to 4 in.	2-1/2 to 4 in.	
Allegany	322	268	6	18	50	21	5	89	71	86
Atlantic	274	253	5	16	56	22	1	94	78	93
B0178-34	281	247	6	21	46	26	1	93	72	95
B0257-9	221	200	8	20	56	16	0	92	72	83
Castile	310	270	10	23	41	24	2	88	65	82
Katahdin (std)	321	267	4	16	44	31	5	91	75	79
K257-1	303	248	15	37	43	5	0	85	48	88
Monona	282	256	4	12	51	30	3	93	81	73
NY78	270	246	6	16	56	22	0	94	78	74
NY91 (K255-6)	262	236	7	17	50	25	1	92	75	90
NY94 (J84-8)	310	274	5	13	50	31	1	94	81	82
Steuben	375	346	2	6	35	53	4	94	88	84
Waller-Duncan LSD (k=100)	39	37								2
C.V. (%)	(10)	(10)						(2)		(2)

¹Size classes: 1 = 1-1/2 to 1-7/8"; 2 = 1-7/8 to 2-1/2"; 3 = 2-1/2 to 3-1/4"; 4 = 3-1/4 to 4"; 5 = over 4"

Plant date: May 3

Vine-kill date: September 9

Harvest date: September 18

Upstate New York Table 8. Plant maturity, tuber shape and appearance, external and internal tuber defects for the late maturity trial grown at Freeville, New York - 1991.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)					Int. Tuber Defects (%) ²		
		Shape	Appear.	Total	Sun- burn	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
Allegany Atlantic	2.0	2.0	5.9	5.8	2.4	3.4	0.0	0.0	2.5	2.5	0.0
	1.3	1.0	6.0	2.1	0.6	1.3	0.2	0.0	7.5	2.5	0.0
B0178-34 B0257-9	1.8	2.0	6.6	4.6	1.4	1.1	0.9	1.2	5.0	5.0	0.0
	1.0	2.0	6.4	2.1	0.0	0.4	1.0	0.7	0.0	0.0	0.0
Castile Katahdin (std)	1.5	3.0	6.9	1.3	0.6	0.5	0.2	0.0	2.5	0.0	0.0
	1.5	2.0	6.3	7.8	5.0	0.2	2.2	0.4	17.5	2.5	0.0
K257-1 Monona	1.0	2.0	7.0	2.8	0.0	0.2	2.6	0.0	7.5	10.0	0.0
	1.3	2.0	5.1	2.4	0.6	1.8	0.0	0.0	0.0	5.0	7.5
NY78 NY91 (K255-6)	2.5	2.0	7.0	2.9	0.8	0.8	1.3	0.0	0.0	5.0	0.0
	1.5	3.0	6.3	2.5	0.9	0.6	0.5	0.5	12.5	7.5	5.0
NY94 (J84-8) Steuben	1.5	1.0	6.3	5.4	0.4	0.5	3.6	0.9	0.0	0.0	0.0
	2.5	1.0	6.4	1.4	0.3	0.0	0.9	0.2	5.0	0.0	0.0

¹See the standard NE107 rating system for a key to these ratings, in the appendix to this report.

²Based on a 10-tuber sample from each of 4 replications. The tubers were taken from size categories 3 and 4.

Update New York Table 9. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for the russet-skinned variety trial grown at Freeville, New York - 1991.

Variety/Clone	Total Yield cwt/A	Marketable Yield percentage of std.	Size Distribution by Class (%) ¹					Size Distribution(%)			Spec. Grav.
			1	2	3	4	5	4 to 12 oz	over 8 oz	over 12 oz	
BelRus B0316-19	255 311	188 187	22 18	50 39	23 25	4 12	1 5	73 64	28 42	5 17	83 81
B0647-1 B0649-5	184 350	121 219	10 12	48 46	27 30	14 7	1 4	75 76	41 41	15 11	69 79
ND671-4 Rus. Burbank (std)	357 444	229 259	30 22	49 41	14 22	6 9	1 6	63 63	21 37	7 15	73 87
Russet Norkotah W1005 RUS	422 409	274 298	17 17	37 49	25 25	13 8	8 1	62 74	46 33	21 9	74 89
Waller-Duncan LSD (k=100)	47	45									3
C.V. (%)	(10)	(15)									(3)

¹Size classes: 1 = less than 4 oz; 2 = 4 to 8 oz; 3 = 8 to 12 oz; 4 = 12 to 16 oz; 5 = over 16 oz.

Plant date: May 8

Vine-kill date: September 9

Harvest date: October 3

Upstate New York Table 10. Plant maturity, tuber shape and appearance, external and internal tuber defects for the russet-skinned variety trial grown at Freeville, New York - 1991.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)				Int. Tuber Defects (%) ²			
		Shape	Appear.	Total	Sun- burn	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
BelRus	2.5	6.0	7.0	2.7	0.1	2.2	0.2	0.2	0.0	0.0	0.0
B0316-19	4.3	6.0	6.1	16.8	1.9	7.9	7.0	0.0	0.0	0.0	0.0
B0647-1	2.8	5.0	6.0	23.2	7.0	5.1	10.8	0.3	0.0	0.0	10.0
B0649-5	5.0	7.0	6.5	20.0	3.0	11.3	5.1	0.6	5.0	0.0	15.0
ND671-4	3.8	6.0	6.3	5.5	1.6	2.4	1.3	0.2	2.5	0.0	0.0
Rus. Burbank (std)	7.8	7.0	5.5	12.9	1.5	11.1	0.3	0.0	22.5	0.0	10.0
Russet Norkotah	3.8	6.0	6.6	10.3	2.8	5.5	0.9	1.1	5.0	2.5	0.0
W1005 RUS	6.8	6.0	6.3	9.8	0.7	9.0	0.0	0.1	5.0	0.0	0.0

¹See the standard NE107 rating system for a key to these ratings, in the appendix to this report.

²Based on a 10-tuber sample from each of 4 replications. The tubers were taken from size categories 3 and 4.

Upstate New York Table 11. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for the USDA breeding clone trial grown at Freeville, New York - 1991.

Variety/Clone	Total Yield cwt/A	Marketable Yield percentage of std.	Size Distribution by Class (%) ¹					Size Distribution(%)		Spec. Grav.
			1	2	3	4	5	1-7/8 to 4 in.	2-1/2 to 4 in.	
Atlantic (std)	375	312	4	11	55	26	4	92	81	87
B0174-11	248	168	5	12	60	19	4	91	79	82
B0174-16	304	243	6	16	58	18	2	92	76	92
B0180-24	403	340	8	24	57	10	1	91	67	78
B0202-4	359	334	3	15	53	28	1	96	81	80
B0234-8	307	262	3	9	61	22	5	92	83	85
B0243-20	246	230	3	13	65	18	1	96	83	81
B0246-6	352	307	4	11	48	33	4	92	81	76
B0473-6	289	221	14	28	54	3	1	85	57	82
B0585-5	295	194	4	9	50	30	7	89	80	75
B0586-3	323	292	3	13	61	20	3	94	81	86
B0587-9	290	264	5	16	60	17	2	93	77	80
B0591-5	306	207	8	16	59	16	1	91	75	77
B0602-1	337	283	11	23	51	15	0	89	66	77
B0610-2	343	310	8	30	58	4	0	92	62	84
Katahdin	332	275	3	12	51	29	5	92	80	74
Kennebec	335	258	4	10	40	41	5	91	81	73
Monona	298	264	5	17	47	28	3	92	75	71
Walter-Duncan LSD (k=100)	35	34								2
C.V. (%)	(8)	(10)								(2)

¹Size classes: 1 = 1-1/2 to 1-7/8"; 2 = 1-7/8 to 2-1/2"; 3 = 2-1/2 to 3-1/4"; 4 = 3-1/4 to 4"; 5 = over 4"

Upstate New York Table 12. Plant maturity, tuber shape and appearance, external and internal tuber defects for the USDA breeding clone trial grown at Freeville, New York - 1991.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)					Int. Tuber Defects (%) ²		
		Shape	Appear.	Total	Sun- burn	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
Atlantic (std)	7.5	1.0	5.8	8.6	2.1	0.5	2.6	3.4	40.0	0.0	0.0
B0174-11	5.7	1.3	5.8	23.7	0.2	1.7	18.9	2.9	3.3	0.0	0.0
B0174-16	6.8	2.0	6.3	12.2	1.5	3.0	1.8	5.9	17.5	0.0	0.0
B0180-24	5.8	3.0	6.0	6.2	1.3	2.1	1.8	1.0	7.5	0.0	5.0
B0202-4	8.0	3.0	5.0	2.6	1.4	0.5	0.7	0.0	25.0	0.0	0.0
B0234-8	6.5	2.8	6.1	6.7	1.3	1.9	1.3	2.2	32.5	0.0	7.5
B0243-20	4.0	2.0	6.0	2.2	0.5	1.0	0.7	0.0	0.0	0.0	0.0
B0246-6	5.8	3.0	5.9	4.6	0.4	1.3	2.0	0.9	0.0	0.0	0.0
B0473-6	6.3	3.7	7.5	8.3	0.2	0.0	7.5	0.6	6.7	0.0	0.0
B0585-5	7.0	1.0	6.8	23.7	0.5	0.4	21.1	1.7	33.3	0.0	0.0
B0586-3	7.7	2.0	5.8	3.2	0.5	0.1	1.5	1.1	10.0	0.0	0.0
B0587-9	5.7	2.0	6.8	1.8	0.2	0.0	0.5	1.1	13.3	0.0	0.0
B0591-5	7.3	3.0	7.5	23.3	0.6	0.6	20.7	1.4	33.3	0.0	10.0
B0602-1	6.0	1.0	6.8	5.0	2.3	0.0	1.8	0.9	13.3	0.0	3.3
B0610-2	7.0	1.8	7.3	1.5	0.6	0.5	0.0	0.4	0.0	0.0	12.5
Katahdin	7.8	2.0	5.6	9.3	6.1	0.0	1.2	2.0	25.0	0.0	2.5
Kennebec	8.3	5.0	4.9	14.2	4.0	2.0	7.3	0.9	10.0	0.0	0.0
Monona	6.8	2.0	4.8	3.6	0.7	1.8	0.3	0.8	7.5	0.0	2.5

¹See the standard NE107 rating system for a key to these ratings, in the appendix to this report.

²Based on a 10-tuber sample from each of 4 replications. The tubers were taken from size categories 3 and 4.

NEW YORK

R.L. Plaisted, B.B. Brodie, D.E. Halseth, S.S. Slack and W.M. Tingey

Early Generations: The crossing program produced 48 round-white combinations with chipping and tablestock potential and 4 between red skinned parents. All segregate for resistance to the golden nematode. There were 151 combinations of trichome hybrids and 42 of *Globodera pallida* resistant clones.

Seeds produced in 1989 produced 27,330 single tubers with chipping potential and 4,572 from trichome crosses. This year we initiated a change in our system of producing first generation tubers. We transplanted approximately 24,000 seedlings to six-inch pots. These included all the red and trichome progenies and some of the round-whites. We saved four of the largest tubers from each pot and stored them in individual paper bags. Only the darkest red clones in the red crosses were saved. We plan to plant the four tubers in four-hill plots in 1992. There were 10,617 sets of four from the round-white crosses, 2,077 dark red clones, and 3,214 trichome clones. The *G. pallida* resistant progenies were transplanted to larger pots and from these, 592 produced six or more tubers. Four of these have been sent to CIP in Lima, Peru for testing against two races of *G. pallida*. One or two tubers are being tested against Ro1 at Ithaca, and one or more tubers will be grown for evaluation for tuber type and used for further crossing.

The seedling hill population consisted of 51,400 round-whites (N's), 690 russets, and 1,443 reds. The round-whites yielded about 16,000 single tuber selections. These were washed, regraded, stored at 48° F for one month then tested with test tape. After this, there were 6,107. The russets and reds were harvested as hills. There were 7 russet selections and 136 red and purple selections. There were 10,829 single hills of the neotuberosum population, from which 1,305 selections were made. Based on test tape results from 48° storage, 725 have chipping potential. These also segregate for immunity to PVX and PVY, and may have some late blight resistance.

There were 3,994 round-white second year observation plots planted as four-hill tuber units (M's) from which 808 were saved at harvest time. After chipping and selection against internal defects, 635 remain to be tested for golden nematode. We expect 400 to be resistant and these will be saved. The russets and reds in this generation were grown as plots using all the tubers saved the

previous year. Twenty six russet clones yielded 6 selections and 28 red clones also gave 6 selections.

The 413 third year round-white selections (L's) were grown in plots 2 rows by 15 hills. At harvest, 116 were saved. After testing for specific gravity, using the mid point between Monona and Atlantic as the threshold for selection, and chipping from 48° and 45° storage, 58 remain. All are resistant to the golden nematode.

Intermediate Generations: The fourth cohort of selections (K's) started with 61 clones. After evaluation for yield, specific gravity, appearance, chip color, and susceptibility to scab, 18 remain. All are resistant to the golden nematode and all have Steuben as the female parent. These have been introduced to our own virus-tested *in vitro* collection.

The fifth year selections (J's) started with eleven clones. Four of these have survived the selection processes. These have been introduced to the Uihlein *in vitro* collection.

There were nine clones (H's) in the sixth year of production. Only three have been saved. These have been added to the Uihlein foundation seed farm for transplant multiplication.

Advanced Generations: A summary of the performance of the most advanced clones is as follows:

NY78 = A9-38 = M348-45 x Katahdin (1977). Late season tablestock. Yielded better in 1991 than 1990 (6 location avg. cwt/A: NY78=341, Monona=339, Atlantic=359). Better tuber size than prior years. Very few pickouts and internal defects. Attractive shape and bright skin. More resistant to scab than Katahdin. Low specific gravity. Poor chip color. Boils white, no sloughing. No problem of uneven stands in 1991. Tubers tend to hang to vine at harvest if there is insufficient time after vine kill. Good resistance to verticillium wilt. Resistant to golden nematode. 14 acres of foundation seed.

NY79 = A73-1 = S377-10 x Elba (1977). Early tablestock. May make acceptable color chips from field. Early yields equal to Superior. Full season yields like Monona. Large tuber size. Round shape. Few growth cracks. No hollow heart in 1991. Low specific gravity. Scurfy skin. Very good scab resistance. Resistant to the golden nematode. 29 acres of foundation seed.

NY84 = D146-11 = Rosa x NY66 (1980). Midseason tablestock. Very good yield. Early sizing. Rapid emergence. Vigorous growth. Large tuber size. Few pickouts and internal defects. Attractive shape. Very good scab resistance. Poor chip color. Boils with slight yellowish cast, slight sloughing. Tuber dormancy like Atlantic. Specific gravity like Monona. Resistant to golden nematode.

NYE11-45 = Rosa x Q155-3 (1981). Mid to late season tablestock. Very high yield. (8 location avg. cwt/A: E11-45 = 377, Monona=337, Atlantic=353). Medium size tubers. Few pickouts and almost no internal defects. Attractive shape and bright skin. Some scab in 1991, like Monona and Atlantic. Specific gravity like Monona. Good chip color from field, 48°, 45°, and 40° with reconditioning. Boils white, no sloughing. Tuber dormancy like Atlantic and Katahdin. Resistant to golden nematode.

NYE55-35 = Allegany x Atlantic (1981). Mid-late season chipstock. Acceptable, but not high yields of marketable tubers. (3 location avg. cwt/A: E55-35=250, Monona=229, Atlantic=293). Small size in prior years, but large size in 1991. Few pickouts. A low percentage of internal necrosis, much less than Atlantic. Attractive shape. Very good scab resistance. Good chip color from field, 48°, 45°, and may recondition from 40°. Specific gravity close to Atlantic. Resistant to golden nematode.

NYE55-44 = Allegany x Atlantic (1981). Early-midseason table and chipstock. Very rapid emergence and early set. Early harvest yield better than Superior. Full season yield close to Atlantic in 1990 but generally between less than Monona and Atlantic in 1991. (8 location avg. cwt/A: E55-44=318, Monona=335, Atlantic=358). Large tuber size. Small percentage of pickouts, generally free of internal defects. Attractive shape, scurfy skin. Scab about like Atlantic. Specific gravity about .005 less than Atlantic. Very good chip color from field, 48°, 45°. Marginal color from 40°. Susceptible to Early Blight. Resistant to golden nematode.

NY87 = F24-12 = Monona x Allegany (1982). Mid-late season chip and tablestock. Very high yields. (8 location avg. cwt/A: NY87=376, Monona=337, Atlantic=353). Early sizing. Large tuber size. Very few pickouts. A low percentage of hollow heart and internal necrosis (less than Monona and Atlantic). Good tuber shape. Bright skin. Scab susceptibility like Monona, less than

Katahdin. Specific gravity slightly (.002) better than Monona. Fair chip color from 48° storage. Boils bright white. Long dormancy. Resistant to golden nematode.

NY88 = G76-29 = NY74 x Q155-3 (1983). Mid-late season chipstock and tablestock. Yields between Monona and Atlantic. (8 location avg. cwt/A: NY88=341, Monona=337, Atlantic=353). Early sizing equal to Superior. Good tuber size. Bright, very attractive tubers. Very few pickouts and internal defects. Scab susceptibility greater than Monona in 1990, but same in 1991. Specific gravity .012 greater than Monona and .007 less than Atlantic. Good chip color from field, better than Monona at all storage temperatures in 1990. Likely will recondition from 40°. Tuber dormancy like Atlantic and Katahdin. Resistant to golden nematode.

Our current plans are to discontinue evaluation of E55-27, E57-13, and NY86. We have made a tentative decision to release NY78, but a name has not been selected for it. If this summer's experience by growers continues to be favorable, a name will be given to the clone and the publication prepared.

NORTH CAROLINA

M.J. Wannamaker & W.W. Collins

Breeding and Evaluation

Twenty-eight North Carolina tetraploid tuber families, 37 tuber families from USDA, 10 North Carolina tetraploid seedling families, and 11 North Carolina seedling families screened at the cotyledon stage for PVY resistance made up the segregating populations in 1991 from which 19,700 single-hill segregates were produced. Five hundred sixteen were selected for evaluations in further trials. An additional 480 segregates resulting from 4X-2X crosses were evaluated for yield and high dry matter content; general and specific combining abilities will facilitate determination of superior parents and crossing combinations. Two hundred twenty-one clones selected in 1990 were evaluated in 20-hill plots at the Mountain Horticultural Crops Research Station (MHCRS) in Fletcher, N.C. and 37 were selected for further trial. Intermediate testing of 47 clones was conducted at the Tidewater Research Station (TRS), Plymouth, N.C. Advanced selections in the round white, red, russet, and yellow flesh categories from the North Carolina program, USDA, and other potato programs were tested in variety trials at TRS and at three on-farm locations in eastern North Carolina. Tests were planted March 20-27 using a randomized complete block design with four replications. Each plot was a 28-hill row with 9-inch spacing within and 38-42 inch spacing between rows. Russets were spaced at 12 inches. Fertilization, pest, and weed control practices were in compliance with those for commercial growers in the area. Plots were harvested 91-99 days after planting (DAP); the russet trial was harvested 113 DAP. Results are presented in North Carolina Tables 1-7.

Russets that performed well were W1005Rus, B0045-6, B0329-1, and B0339-1. Reddale, Dark Red Norland, B0806-13, and B0811-13 were among the highest yielding reds; Dark Red Norland was more prone to rotting after harvest than the others. Clones in the round white category that had good chip color and yield when compared to Atlantic included B0178-30, B0256-1, Coastal Chip, NC012-19, and NC018-3. Additional areas of research include studies relating to internal necrosis, early blight and maturity studies, and transfer of selected traits from the diploid to tetraploid level. The second year of an inter-regional study between Virginia, New Jersey, Washington, and North Carolina was conducted to study the influence of pre-planting temperature stress on the development on internal heat necrosis in 'Atlantic' potato. Pre-planting temperature stress was not found to influence the amount of internal heat necrosis that developed.

Adaptation and
Diploid Breeding

Evaluation and maintenance of a diploid Solanum phureja-Solanum stenotomum (PHU-STN) hybrid population continues. Four separate and specific populations had previously been selected from the original population and improved independently. Traits improved included specific gravity, Alternaria solani resistance, Erwinia soft rot resistance, and heat tolerance. The four populations were recombined into one population and selection is now continuing for individuals combining high levels of all factors. Because of severe PVY and PVX disease pressure in North Carolina, the recombined population has been evaluated for the presence of resistance and immunity genes to PVY and PVX. A total of 8 individuals out of an original seedling population of 6000 has been determined to be immune to PVX; 224 individuals appear immune to PVY. Also, high levels of resistance to the two viruses were found in other individuals. At present, the mode of inheritance of the PVX and PVY immunity is being studied. Immune clones will be evaluated for 2N pollen production and, if possible, used in crosses with tetraploids, commercial-type parents.

A sample of the population was also crossed with several accessions of Solanum berthaultii which have high levels of Type A and B trichomes and PPO activity as a further resistance mechanism to the transfer of the PVY virus. Individuals have been selected with high levels of the three factors. Broad-sense heritability of Type A trichomes has been measured at 0.58-0.60 and of Type B, 0.42-0.87.

Other continuing studies include the study of stability of specific gravity over environments, the study of genotypic, phenotypic and environmental correlations between maturity and early blight resistance, and the quantification of level of heat tolerance in the hybrid PHU-STN population.

NORTH CAROLINA Table 1. Potato Variety Trial at Bright Farm, Pasquotank County - 1991¹.

CLONE	TOTAL YIELD CWT/A	MARKETABLE YIELD CWT/A	TUBER ² APPEAR- ANCE	SPECIFIC GRAVITY	CHIP COLOR ³			HOLLOW HEART	HEAT ⁴ NECROSIS	ROTS ⁴	VINE ⁵ MATURITY
					1	2	3				
B9988-7	324.5	303.8	118	1.072	3	6	6	5.0	0	0	2
B0257-12	315.1	298.0	116	1.072	4	6	6	5.3	0	0	2
B0178-34	303.1	283.3	110	1.078	2	3	3	2.7	1	0	3
COASTAL CHIP	299.9	272.6	106	1.072	2	3	3	2.7	0	0	2
B0202-4	296.4	277.6	108	1.069	2	3	4	3.0	0	0	6
NC004-1	291.5	269.4	104	1.074	5	7	8	6.7	2	0	2
B0174-16	284.0	253.8	98	1.082	4	6	7	5.7	0	0	2
B0176-24	283.4	266.1	103	1.071	3	6	8	5.7	1	0	5
B0256-1	280.0	264.5	103	1.082	3	6	8	5.7	0	0	4
ATLANTIC (STD)	276.7	257.9	100	1.083	3	5	6	4.7	5	1	3
B0178-30	276.4	253.0	98	1.082	3	5	5	4.3	0	0	2
B0172-22	268.5	252.2	98	1.073	3	7	5	5.0	2	0	5
NC018-3	268.2	240.7	93	-	6	7	8	7.0	0	0	3
NDA2126-6	264.5	238.3	92	1.060	7	8	9	8.0	0	0	6
B0257-3	264.0	235.8	91	1.082	3	5	6	4.7	0	0	3
B0241-8	258.4	242.4	94	1.072	4	6	7	5.7	1	0	4
NC012-19	249.4	241.5	94	1.076	5	3	3	3.7	1	0	3
B0237-9	247.9	228.4	89	1.069	2	3	3	2.7	0	0	1
NC012-18	243.5	231.7	90	1.078	3	4	3	3.3	2	0	2
B0179-17	228.8	212.0	82	1.074	3	3	3	3.0	0	0	5
NC017-3	224.7	209.6	81	1.061	7	8	9	8.0	0	0	4
STEUBEN	223.8	216.2	84	1.063	6	6	6	6.0	0	0	6
SUPERIOR	219.6	202.3	78	1.066	5	7	6	6.0	1	0	2
A80559-2	216.3	197.3	76	1.082	2	3	4	3.0	0	0	5
WALLER LSD	41.5	42.0									
CV (%)	10.9	11.6									
MEAN	267.1	247.9									

¹Trial planted 3/27/91, harvested 6/26/91 (91 DAP).²Tuber appearance: 1= very poor, 3= poor, 5= fair, 7= good, 9= excellent.³Chip color supplied by Wise Foods 6/28/91, 7/3/91, and 7/10/91. 1= very light, 5= acceptable, 9= very dark.⁴Number of tubers out of 40 (10/rep) with internal disorder.⁵Vine maturity: 1= very early, 5= medium, 9= very late.

NORTH CAROLINA Table 2. Potato Variety Trial at Cooper Farm, Tyrrell County - 1991¹.

CLONE	TOTAL YIELD CWT/A	MARKETABLE YIELD		TUBER ² APPEAR- ANCE	SPECIFIC GRAVITY	CHIP COLOR ³			HOLLOW HEART	HEAT ⁴ NECKROSIS	ROTS ⁴	VINE ⁵ MATURITY
		CWT/A	% STD			1	2	3				
ATLANTIC (STD)	332.6	314.4	100	7	1.076	2	6	8	5.3	0	0	6
B0257-12	325.9	310.3	99	8	1.071	5	7	7	6.3	0	0	3
NC018-3	323.3	306.2	97	6	1.067	5	7	7	6.3	0	0	4
NC012-18	316.6	308.7	98	7	1.069	2	5	7	4.7	2	0	3
B0178-30	313.8	294.7	94	7	1.073	3	3	3	3.0	0	0	4
B0256-1	313.1	301.3	96	8	1.079	5	7	8	6.7	0	0	6
NC004-1	312.8	290.7	92	7	1.069	4	8	9	7.0	0	0	2
NC012-19	312.8	307.0	98	7	1.075	2	3	3	2.7	1	0	5
B0257-3	312.3	288.2	92	7	1.074	3	6	6	5.0	0	0	4
B0174-16	306.7	284.1	90	7	1.070	3	8	8	6.3	0	0	3
COASTAL CHIP	300.8	283.3	90	7	1.063	2	5	5	4.0	0	0	3
B0172-22	294.9	279.2	89	6	1.073	3	6	6	5.0	0	0	5
B0178-34	291.3	275.1	88	7	1.076	3	6	7	5.3	0	0	4
B0241-8	288.9	279.2	89	7	1.066	3	6	8	5.7	0	0	5
B9988-7	283.5	270.2	86	5	1.068	2	6	7	5.0	0	0	3
B0176-24	278.1	262.0	83	7	1.065	6	7	7	6.7	1	0	5
B0179-17	259.4	244.8	78	6	1.069	4	7	8	6.3	4	0	5
SUPERIOR	257.1	243.2	77	7	1.065	5	7	8	6.7	0	1	2
B0202-4	255.9	239.1	76	7	1.058	3	6	5	4.7	0	0	8
B0237-9	250.5	234.2	74	8	1.061	2	3	3	2.7	0	0	1
NDA2126-6	246.1	226.0	72	5	1.057	7	9	9	8.3	0	0	7
A80559-2	229.9	215.3	68	7	1.066	2	6	6	4.7	0	0	8
NC017-3	216.3	204.7	65	5	1.056	8	9	9	8.7	0	0	5
CALCHIP	177.2	157.2	50	6	1.083	3	8	9	6.7	0	0	8
WALLER LSD	71.7	70.5										
CV (%)	16.1	17.0										
MEAN	283.3	267.5										

¹ Trial planted 3/20/91, harvested 6/25/91 (97 DAP).

² Tuber appearance: 1= very poor, 3= poor, 5= fair, 7= good, 9= excellent.

³ Chip color supplied by Wise Foods 6/27/91, 7/3/91, and 7/10/91. 1= very light, 5= acceptable, 9= very dark.

⁴ Number of tubers out of 40 (10/rep) with internal disorder.

⁵ Vine maturity: 1= very early, 5= medium, 9= very late.

NORTH CAROLINA Table 3. Potato Variety Trial at McCotter Farm, Pamlico County - 1991¹

CLONE	TOTAL YIELD CWT/A	MARKETABLE YIELD		TUBER ² APPEAR- ANCE	SPECIFIC GRAVITY	CHIP COLOR ³		HOLLOW HEART	HEAT ⁴ NECROSIS	ROTS ⁴	VINE ⁵ MATURITY
		CWT/A	% STD			1	2				
B0178-30	369.6	341.4	108	7	1.080	3	3	0	5	0	3
ATLANTIC (STD)	346.0	315.2	100	7	1.084	2	4	0	8	0	3
NC018-3	341.9	312.8	99	8	1.074	6	4	0	5	0	2
COASTAL CHIP	339.8	307.9	98	5	1.079	5	6	0	0	0	2
B0172-22	332.6	316.0	100	5	1.082	3	3	1	0	0	4
B9988-7	331.9	309.5	98	6	1.073	4	6	0	1	0	3
B0178-34	329.9	307.1	97	7	1.087	3	3	0	2	0	4
B0256-1	326.2	304.6	97	7	1.082	3	4	0	0	0	3
NDA2126-6	325.4	285.7	91	6	1.064	5	7	0	7	0	6
NC012-18	324.5	304.6	97	8	1.082	2	3	1	3	0	2
B0202-4	314.6	277.6	88	8	1.080	4	3	0	0	0	5
NC012-19	311.8	295.6	94	6	1.083	4	4	4	3	0	2
B0257-3	311.0	279.2	89	7	1.087	5	5	0	0	0	3
A80559-2	309.6	289.8	92	8	1.085	4	4	0	1	0	6
STEUBEN	309.3	302.1	96	7	1.070	5	8	0	0	0	7
B0176-24	308.2	293.1	93	7	1.082	4	6	0	1	0	3
NC017-3	301.3	280.0	89	7	1.074	7	8	0	2	0	4
B0179-17	300.0	284.1	90	7	1.080	3	6	0	2	0	6
SUPERIOR	297.4	272.7	87	9	1.073	3	4	1	8	0	1
NC004-1	289.8	247.3	78	6	1.076	7	7	1	1	0	2
B0241-8	288.2	265.3	84	7	1.074	5	5	2	7	0	3
B0257-12	286.1	266.9	85	6	1.077	3	5	0	0	0	2
B0174-16	283.6	257.9	82	6	1.084	3	6	0	0	0	2
B0237-8	258.2	221.1	70	8	1.073	3	5	4	1	0	1
WALLER LSD	71.9	60.0									
CV (%)	11.7	12.0									
MEAN	314.1	289.1									

¹Trial planted 3/21/91, harvested 6/28/91 (99 DAP).²Tuber appearance: 1= very poor, 3= poor, 5= fair, 7= good, 9= excellent.³Chip color supplied by Wise Foods 7/2/91 and 7/11/91. 1= very light, 5= acceptable, 9= very dark.⁴Number of tubers out of 40 (10/rep) with internal disorder.⁵Vine maturity: 1= very early, 5= medium, 9= very late.

NORTH CAROLINA Table 4. Northeast 107 Regional Trial at Tidewater Research Station, Plymouth, N.C. 1991¹.

CLONE	TOTAL YIELD CWT/A	MARKETABLE YIELD		TUBER ² APPEAR- ANCE	SPECIFIC GRAVITY	CHIP COLOR ³		HOLLOW ⁴ HEART	HEAT ⁴ NECROSIS	ROTS ⁴	VINE ⁵ MATURITY
		CWT/A	% STD			1	2				
BO256-1	290.3	262.5	111	7	1.070	5	7	6.0	1	0	4
AF1060-2	288.9	242.5	102	6	1.059	6	8	7.0	1	0	5
SAGINAW GOLD	274.0	193.9	82	3	1.067	3	5	4.0	2	0	5
BO178-34	273.6	233.8	99	5	1.083	4	4	4.0	9	0	4
ATLANTIC (STD)	272.0	236.6	100	6	-	-	-	-	19	0	4
NORCHIP	268.9	218.8	92	6	1.068	6	9	7.5	3	0	6
KENNEBEC	264.8	217.8	92	6	1.061	9	9	9.0	0	0	4
AF875-15	257.1	219.1	93	5	1.077	3	6	4.5	1	0	4
SUPERIOR	255.5	227.6	96	7	-	-	-	-	0	0	4
NY84	241.4	198.9	84	5	1.056	6	8	7.0	0	0	4
STEUBEN	240.9	203.7	86	5	1.064	-	-	-	1	0	5
AF1302-1	232.4	184.2	78	5	1.062	5	8	6.5	5	0	3
YUKON GOLD	220.9	199.6	84	5	1.067	7	9	8.0	13	0	3
F82086	218.0	156.2	66	5	1.065	9	9	9.0	1	0	3
E55-44	217.6	199.3	84	7	1.073	2	2	2.0	1	0	3
KATAHDIN	213.5	184.5	78	6	1.064	7	9	8.0	5	0	3
BO257-3	212.2	167.2	71	7	1.072	3	5	4.0	2	0	4
AF875-16	199.6	151.6	64	5	1.078	4	6	5.0	0	0	3
WALLER LSD	80.3	77.4									
CV (%)	17.0	20.5									
MEAN	246.8	205.4									

¹Trial planted 3/26/91, harvested 7/1/91 (97 DAP).

²Tuber appearance: 1= very poor, 3= poor, 5= fair, 7= good, 9= excellent.

³Chip color supplied by Wise Foods 7/9/91 and 7/15/91. 1= very light, 5= acceptable, 9= very dark.

⁴Number of tubers out of 40 (10/rep) with internal disorder.

⁵Vine maturity: 1= very early, 5= medium, 9= very late.

NORTH CAROLINA Table 5. Red Variety Trial at Tidewater Research Station, Plymouth, N.C. - 1991¹.

CLONE	TOTAL YIELD CWT/A	MARKETABLE		TUBER ² APPEAR- ANCE	SPECIFIC GRAVITY	CHIP COLOR ³	HOLLOW HEART	HEAT ⁴ NECROSIS	ROTS ⁴	VINE ⁵ MATURITY
		YIELD	% STD							
B0806-13	309.8	251.7	121	4	1.061	6	0	0	0	3
B0808-4	285.9	189.3	91	6	1.071	5	0	22	0	3
REDDALE (STD)	285.8	208.3	100	3	1.057	-	2	0	0	3
B0808-3	283.8	186.2	89	5	1.069	7	1	17	0	3
B0811-13	281.2	239.4	115	6	1.066	6	0	0	0	2
B0811-2	276.8	186.8	90	6	1.071	7	0	11	0	2
DK RED NORLAND	271.7	224.8	108	8	1.055	9	0	1	0	3
B0800-12	249.6	133.0	64	4	1.056	7	0	2	0	3
ND224-5R	249.1	194.3	93	8	1.054	8	0	0	0	3
RED PONTIAC	243.8	190.3	91	3	1.058	8	0	1	0	2
B0616-4	241.9	194.2	93	5	1.062	7	0	15	0	2
REDSEN	240.4	163.4	78	8	1.063	5	0	0	0	3
CHIEFTAIN	233.0	188.3	90	5	1.063	8	0	4	0	3
CHERRY RED	180.8	138.0	66	7	1.069	7	1	0	0	3
WALLER LSD	65.4	59.2								
CV (%)	15.1	19.5								
MEAN	259.5	192.0								

¹Trial planted 3/26/91, harvested 7/1/91 (97 DAP).

²Tuber appearance: 1= very poor, 3= poor, 5= fair, 7= good, 9= excellent.

³Chip color supplied by Wise Foods 7/9/91. 1= very light, 5= acceptable, 9= very dark.

⁴Number of tubers out of 40 (10/rep) with internal disorder.

⁵Vine maturity: 1= very early, 5= medium, 9= very late.

NORTH CAROLINA Table 6. Round White Augmented Trial at Tidewater Research Station, Plymouth, N.C. - 1991¹

CLONE	TOTAL YIELD CWT/A	MARKETABLE YIELD		TUBER ² APPEAR- ANCE	SPECIFIC GRAVITY	CHIP COLOR ³		HOLLOW ⁴ HEART	HEAT ⁴ NECROSIS	ROTS ⁴	VINE ⁵ MATURITY	
		CWT/A	% STD			1	2					MEAN
REPLICATED ENTRIES												
B0184-18	360.3	300.6	115	7	1.061	6	9	7.5	2	7	0	4
NC011-1	319.8	274.8	105	5	1.054	5	8	6.5	1	5	0	3
B0608-5	298.2	242.8	93	7	1.058	3	3	3.0	0	12	0	3
B0613-2	298.0	259.7	100	5	1.063	6	6	6.0	0	2	0	3
B0246-6	295.7	275.1	106	6	1.064	6	8	7.0	0	1	0	3
ATLANTIC (STD)	287.4	260.5	100	6	1.070	5	7	6.0	4	20	0	3
B0179-6	258.6	191.6	74	5	1.077	4	5	4.5	0	11	0	5
NC013-22	255.5	206.5	79	4	1.059	3	5	4.0	1	3	0	4
B0602-1	254.0	193.5	74	8	1.059	8	9	8.5	0	18	0	3
B0405-6	252.8	218.3	84	5	1.065	7	9	8.0	0	10	0	4
NC014-1	248.9	160.8	62	2	1.053	4	8	6.0	2	3	0	3
NC004-1	234.2	195.5	75	6	1.060	6	8	7.0	0	0	0	2
SUPERIOR	224.3	205.9	79	5	1.056	6	9	7.5	0	5	0	3
B0581-N1	215.5	159.2	61	5	1.055	7	5	6.0	0	5	1	7
B0613-3	210.7	168.2	65	6	1.061	4	8	6.0	1	0	0	5
NC015-5	210.1	139.8	54	2	1.057	7	9	8.0	1	0	0	3
B0245-15	209.6	160.6	62	3	1.059	5	8	6.5	3	4	0	4
B0697-N2	204.2	171.6	66	6	1.068	5	9	7.0	5	0	0	4
B0671-N3	196.0	156.5	60	6	1.068	9	9	9.0	1	18	0	3
WALLER LSD	43.6	41.6										
CV (%)	12.7	15.1										
MEAN	254.4	207.5										
NON-REPLICATED ENTRIES												
B0961-N18	367.5	292.8	112	6	1.088				0	1	0	4
B0583-2	361.6	302.0	116	4	1.071				2	0	0	6
B0622-2	322.3	265.9	102	4	1.062				0	2	0	4
B0583-8	321.6	272.5	105	5	1.075				0	1	0	4
B0961-N26	317.0	295.4	113	6	1.062				1	3	0	7
B0753-16	302.6	244.3	94	5	1.066				2	6	0	6
B0753-13	291.5	226.6	87	6	1.068				0	3	0	3

(Continued)

NORTH CAROLINA TABLE 6. (Continued)

CLONE	TOTAL YIELD CWT/A	MARKETABLE YIELD CWT/A	TUBER ² APPEAR- ANCE	SPECIFIC GRAVITY	CHIP COLOR ³		HOLLOW ⁴ HEART	HEAT ⁴ NECROSIS	ROTS ⁴	VINE ⁵ MATURITY
					1	2				
NON-REPLICATED ENTRIES (Contd.)										
B0687-14	289.5	193.9	74	4	1.059		0	0	0	3
B0682-2	286.3	242.4	93	6	1.061		1	1	0	4
B0582-1	281.0	258.1	99	4	1.061		0	0	0	3
B0895-N12	275.8	224.0	86	5	1.064		0	1	0	3
B0888-N17	264.0	140.2	54	5	1.059		0	1	0	6
B0888-N3	263.3	233.2	89	6	1.065		1	0	0	5
B0930-N9	246.3	192.6	74	7	1.073		0	0	0	4
B0405-4	240.4	217.5	83	5	1.071		1	7	0	4
B0756-2	239.1	199.8	77	6	1.067		0	9	0	3
B0910-N7	237.1	161.1	62	8	1.052		0	7	0	3
B0895-N3	228.6	160.5	62	6	1.074		0	1	0	4
B0888-N1	228.6	172.9	66	7	1.075		0	0	0	4
B0721-3	216.8	183.4	70	6	1.065		0	0	0	2
B0951-N8	203.7	169.0	65	5	1.067		0	1	0	3
B0929-N6	203.7	161.1	62	6	1.065		0	0	0	3
B0843-N11	200.4	124.5	48	4	1.069		0	0	0	5
B0851-N43	197.8	169.0	65	7	1.061		0	0	0	4
B0871-N4	197.2	151.3	58	4	1.063		0	0	0	6
B0868-N17	173.6	129.7	50	5	1.056		0	0	0	2
B0951-N12	169.7	140.2	54	3	1.060		0	3	0	7
B0905-N24	146.1	80.6	31	5	1.061		3	9	0	4

¹ Trial planted 3/26/91, harvested 7/1/91 (97 DAP).

² Tuber appearance: 1= very poor, 3= poor, 5= fair, 7= good, 9= excellent.

³ Chip color of replicated entries supplied by Wise Foods 7/9/91 and 7/15/91. 1= v. light, 5= acceptable, 9= v. dark.

⁴ Number of tubers out of 40 (10/rep) with internal disorder.

⁵ Vine maturity: 1= very early, 5= medium, 9= very late.

NORTH CAROLINA Table 7. Russet Augmented Trial at Tidewater Research Station, Plymouth, N.C. - 1991¹

CLONE	TOTAL YIELD CWT/A	MARKETABLE		TUBER ² APPEARANCE	SPECIFIC GRAVITY	HOLLOW ³ HEART	HEAT ³ NECROSIS	ROOTS ³
		CWT/A	% STD					
REPLICATED ENTRIES								
W1005RUS	305.2	205.0	122	4	1.064	0	0	0
RUSSET BURBANK	288.9	121.2	72	2	1.068	0	13	0
B0045-6	265.4	212.2	126	7	1.066	0	0	0
B0455-27	246.9	134.9	80	4	1.062	0	0	0
FRONTIER RUSSET	228.4	152.6	91	4	1.062	1	0	0
B0220-14	220.8	157.8	94	4	1.060	0	0	0
B9922-11	219.1	171.0	102	4	1.068	0	2	0
NEMARUS (STD)	202.4	168.0	100	8	1.059	0	1	0
B0493-8	200.1	155.5	93	4	1.060	0	0	0
B0324-25	199.4	139.2	83	5	1.061	0	0	0
BELRUS	195.7	143.1	85	4	1.068	0	0	0
B0310-11	176.0	124.4	74	4	1.067	0	0	0
B0324-5	175.9	129.4	77	5	1.062	0	0	0
ND671-4	173.6	101.5	60	4	1.051	0	0	0
HILITE RUSSET	172.3	114.9	68	4	1.059	0	1	0
RUSSET NORKOTAH	122.8	90.4	54	4	1.061	0	0	0
WALLER LSD	101.1	130.2						
CV (%)	28.1	40.0						
MEAN	212.1	145.1						
NON-REPLICATED ENTRIES								
B0339-1	308.5	238.4	142	7	1.070	0	0	0
B0329-1	288.9	213.5	127	5	1.066	0	0	0
B0338-17	269.9	119.2	71	1	1.071	0	0	0
B0311-2	249.6	163.9	97	4	1.066	0	0	0
B0306-6	214.2	146.7	87	7	1.065	0	1	0
B0332-13	193.2	93.0	55	3	1.066	0	0	0
B0362-2	153.9	104.8	62	5	1.072	0	0	0
B0315-17	119.9	43.2	26	5	1.067	0	0	0

¹Trial planted 3/26/91, harvested 7/17/91 (113 DAP).

²Tuber appearance: 1= very poor, 3= poor, 5= fair, 7= good, 9= excellent.

³Number of tubers out of 40 (10/rep) with internal disorder.

1991 NORTH DAKOTA POTATO BREEDING REPORT

R. H. Johansen, Bryce Farnsworth, Gary Secor and Dan Ronis

Crossing and Seedling Production

During the 1991 season 322 crosses were made in the greenhouse and 51,500 seedling plants from the 1991 and 1990 crosses were produced in the greenhouse.

At the Langdon Agricultural Experiment Station, 50,000 seedling tubers from the 1990 greenhouse crop were grown in the field. The seedlings were planted on May 14 and 15 and harvested on September 16 and 17. Harvesting of the seedlings was halted by a snowstorm on the evening of September 17 and harvesting was resumed on September 19 at which time the harvest was completed. Rainfall was more than adequate during the season.

Advanced Selections

There were 733 second year selections planted on May 20 in an adaptation trial at Grand Forks and on May 21 in the Absaraka seed increase plot. At harvest on September 3 at Grand Forks and on September 10 at Absaraka, 223 selections were saved. Of the older material 278 selections were planted and 172 were saved at harvest.

Promising Selections

Outstanding advanced North Dakota selections were ND1538-1Russ, ND2224-5R, ND671-4Russ, ND2471-8, ND2417-6 and ND1871-3R. In 1991 seed of both ND1538-1Russ and ND671-4Russ had a fairly large increase in North Dakota and several other seed producing states. The most outstanding characteristic of ND1538-1Russ is its resistance to hollow heart and scab and its extremely white flesh before and after cooking. ND1871-3R, a Red Pontiac maturing selection with good color, looks quite promising. Two cold chipping selections with good yield and high total solids are ND2471-8 and ND2417-6.

Cultivar and Selection Trials

Potato variety trials were again planted in replicated trials at Grand Forks, Park River, Williston and Minot. The Grand Forks trial had 31 entries; the Park River trial had 23 entries and the Minot and Williston trial had nine entries. As in past years, the trials were randomized blocks of four replications and 25 hills. The Grand Forks trial was planted on May 20th

and harvested on September 24 while the Park River trial was planted on May 9th and harvested on September 12. Planting and harvest dates and other information are found in North Dakota Table 1.

After three years of drought, the weather finally changed and more than sufficient rainfall fell in 1991. Harvest had to be delayed at Park River because it was too wet. The average yield of all entries in 1991 at Park River was 145 cwt/acre compared to 119cwt/acre in 1990. The Grand Forks trial in 1991 had an average of 131 cwt/acre compared to 102 cwt/acre in 1990.

The top yielders in the 1991 trial were Russet Norkotah, Red Pontiac and ND1871-3R. Other high yielders were LA12-59 and NorKing Russet. Ranger, a new cultivar from Idaho did not produce a high U.S. No. 1 yield and that can be attributed to the low percent U.S. No. 1's caused by knobs and rough tubers. Ranger was very similar to Russet Burbank in U.S. No. 1 yield and shape. ND2471-8, a good chipping cultivar, produced a fairly high U.S. No. 1 yield at Grand Forks, but did not at Park River (North Dakota Table 2).

Total solids were quite high in the 1991 trials. The highest ratings for total solids were ND2471-8 with an overall average of 22.7 percent and Norchip with 22.4 percent. Red Pontiac with 18.2 percent total solids was the lowest. Data from the Williston and Minot trial are found in Table 4.

Additional New Selections

This trial consisted of advanced selections that are new in the breeding program and new cultivars from other states. If entries in this trial show promise, they are put in the statewide trial the next year. None of the selections in this trial excelled that of Russet Norkotah in yield (North Dakota Table 3).

Processing Tests - Chipping

During the winter and spring of 1991, chip tests were conducted on cultivars and selections grown in trials the previous season. Samples were chipped from both the 1990 Grand Forks, North Dakota and Park River, North Dakota trials. The advanced selections and varieties were chipped out of 40° F storage and then chipped after reconditioning at 65° F for two and four weeks. Agtron readings and percent chip yield were recorded.

This data showed that several selections have the potential to be good chip cultivars. When considering selections that are good chippers and also have good yield, total solids and other outstanding characteristics, ND2471-8 and ND2417-6 both rank near the top. ND2471-8 is from a cross between

Yankee Chipper and ND860-2. Selection ND2417-6 is from a cross between Norchip and ND860-2. Both of these selections are good to fair yielders and have high total solids. Foundation seed of both of these is being increased and by the 1993 season seed should be available for increase and testing.

As shown in Table 5, several selections will cold chip almost as well as ND860-2. To name a few, ND2008-2, ND2264-7, ND2471-8, ND2642-8 and ND1725-4 are in this cold chipping class.

Of the cultivars tested, Gemchip was no better than Norchip for chipping. Gemchip is a new variety out of Idaho, however, it has been very disappointing in its overall performance. It produced very low yields at the two locations in North Dakota during 1991.

Processing Trials - French Fries and Flakes

Several selections and check cultivars were tested for french fry and flake quality by the Food and Nutrition Department of the College of Home Economics at NDSU (ND Table 6).

The samples were tested for color, texture and flavor, which are important for good processing qualities. The best french fry samples were NorKing Russet, Shepody, ND671-4Russ, ND2829-8Russ, ND1538-1Russ, ND2973-10Russ, and AT9-77259B-8Russ. Most of these selections had scores better than the check samples Ore-Ida and Simplot products. Norchip, NorKing Russet and ND2417-6 had the best flake scores.

North Dakota Table 1. Spacing, Fertilizer, Soil Type, Planting and Harvest Dates of the 1991 North Dakota Potato Variety Trials.

Location	Spacing		Fertilizer	Soil Types	Planting Date	Harvest Date
	Row	Plant				
Park River	38"	12"	40-10-0 @ 150#/A	Glyndon silt loam	5/9	9/12
Grand Forks	38"	12"	22-22-12 @ 400#/A	Bearden clay loam	5/20	9/24
Williston	36"	16"	None	Williston loam	5/17	10/1
Minot	42"	15"	102 Toro	Williams Loam	5/17	9/25

North Dakota Table 2. U.S. No. 1 Yield, Percent U.S. No. 1 and Percent Total Solids of Cultivars and Selections Grown in State-wide Trials in North Dakota during 1991.

Variety or Selection	Grand Forks			Park River			Average		
	Cwt/A	%	%	Cwt/A	%	%	Cwt/A	%	%
	U.S.#1 Yield	U.S. # 1	Total Solids	U.S.#1 Yield	U.S. # 1	Total Solids	U.S.#1 Yield	U.S. # 1	Total Solids
Russet Norkotah	182	87	21.2	191	84	19.9	187	86	20.6
Red Pontiac	156	89	18.8	198	73	17.5	177	81	18.2
ND1871-3R	144	92	19.2	210	85	18.8	177	89	19.0
NorKing Russet	127	85	21.2	198	84	19.9	163	85	20.6
La 12-59	128	90	21.8	196	84	20.9	162	87	21.4
Norchip	127	82	22.7	174	72	22.0	151	77	22.4
ND2382-15	137	79	21.4	162	58	21.4	150	69	21.4
Norgold Russet	139	85	20.1	154	75	19.9	147	80	20.0
ND2224-5R	176	84	19.4	112	81	18.2	144	83	18.8
ND671-4Russ	129	83	20.1	156	80	18.6	143	82	19.4
ND1538-1Russ	127	81	21.2	148	70	19.0	138	76	20.1
ND2008-2	134	83	21.6	134	77	19.0	134	80	20.3
Red Norland	125	82	19.2	141	73	17.7	133	78	18.5
ND2471-8	163	88	23.3	97	77	22.0	130	83	22.7
ND2225-1R	130	84	20.5	127	76	20.1	129	80	20.3
Frontier	96	77	21.4	152	76	21.2	124	77	21.3
Shepody	97	82	22.0	151	63	21.2	124	73	21.6
ND3166-2	139	87	20.9	103	75	19.9	121	81	20.4
ND860-2	136	83	21.8	101	64	20.1	119	74	21.0
Russet Burbank	78	57	20.7	138	56	21.2	108	57	21.0
Ranger	105	78	21.8	111	54	21.8	108	66	21.8
Gemchip	108	86	21.4	99	73	19.7	104	80	20.6
ND2264-7	125	82	20.1	72	63	19.9	99	73	20.0
ND1995-1	144	86	22.9						
ND2417-6	137	82	22.0						
ND1382-6R	135	83	20.3						
ND1618-13R	135	89	19.4						
ND1196-2R	135	84	18.0						
ND2676-4	134	81	22.2						
ND2845-5	118	81	23.3						
ND1562-4R	105	83	18.0						
Average	131	83.1	20.9	145	72.7	19.9	138	78.1	20.5

North Dakota Table 3. Advanced Selections and Cultivars Trial Grown at Grand Forks, ND - 1991.

Selection or Cultivar	U.S. No. 1 Yield Cwt/A	% U.S. No. 1	% Total Solids
Norchip	153	82	20.9
Red Norland	140	76	18.8
Russet Norkotah	211	86	21.2
AT6-84371-1Russ	107	72	19.7
ND1342-18	134	82	21.4
ND1995-1	114	80	21.2
ND2013-4	145	86	20.7
ND2050-1R	179	85	19.9
ND2642-8	103	72	21.8
ND2676-10	172	87	21.4
ND2676-12	189	88	21.2
ND2818-7Russ	153	83	19.4
ND2973-10Russ	164	79	20.9
ND2979-48	135	83	21.2
ND3196-1R	193	91	20.9
Average	153	82	20.7

North Dakota Table 4. U.S. No. 1 Yield, Percent U.S. No. 1, Percent Total Solids of Selections and Cultivars Grown in Trial at Minot and Williston, ND - 1991.

Cultivar or Selection	MINOT			WILLISTON		
	U.S. #1 Yield Cwt/A	% U.S. No. 1	% Total Solids	U.S. #1 Yield Cwt/A	% US No. 1	% Total Solids
Norchip	175	91	21.4	39	63	23.5
Norgold Russet	142	82	19.9	29	51	21.4
Red Norland	169	92	18.4	52	72	19.9
Red Pontiac	189	93	18.2	51	76	19.9
Russet Burbank	120	72	21.4	22	44	20.7
Russet Norkotah	151	84	19.9	28	51	23.1
ND671-4Russ	144	73	20.1	18	42	--
ND1538-1Russ	186	85	19.9	28	51	22.2
ND1871-3R	157	85	19.4	28	57	21.8
Average	159	84	19.8	33	56	21.8

North Dakota Table 5. 1991 Chip Tests and Percent Yield of Cultivars and Selections Grown in Trial During 1990.

Variety or Selection	First Chipping		Second Chipping		Third Chipping		Average - Three Tests			
	40° Since Harvest		65° for Two Weeks		65° for Four Weeks		Percent Yield		Agtron	
	Grand Forks ¹	Park River ²	Grand Forks ³	Park River ⁴	Grand Forks ⁵	Park River ⁶	Grand Forks	Park River	Grand Forks	Park River
----- Agtron Reading -----										
Frontier	8.5	12.5	12.0	20.5	15.5	25.0	32.6	36.1	12.0	19.3
Gemchip	11.0	12.5	19.5	36.5	30.5	46.0	30.9	32.9	20.3	31.6
Norchip	8.5	13.0	27.5	34.0	42.0	43.0	32.5	32.0	26.0	30.0
Norgold Russet	9.5	11.0	18.0	20.0	20.0	25.0	30.2	31.8	15.8	18.7
NorKing Russet	11.5	17.0	20.0	27.0	23.5	47.0	32.2	32.3	18.3	30.3
Russet Burbank	10.5	11.0	18.5	21.0	25.5	28.5	33.6	32.9	18.2	20.2
Russet Norkotah	8.5	12.5	25.5	28.5	29.5	38.0	31.7	32.5	21.2	26.3
Shepody	7.5	13.0	18.5	27.0	24.0	44.0	32.4	34.7	16.7	28.0
ND651-9	13.0	17.5	38.0	47.5	43.5	51.5	31.3	32.1	31.5	38.8
ND671-4Russ	12.0	19.5	19.0	26.5	24.0	38.5	29.2	32.6	18.3	28.2
ND860-2	33.0	34.0	57.0	53.5	55.0	56.0	31.5	34.5	48.3	47.8
ND986-9	10.5	11.0	24.5	23.5	31.0	33.5	32.6	31.9	22.0	22.7
ND1538-1Russ	11.5	13.5	16.0	19.0	22.5	34.0	30.9	31.5	16.7	22.2
ND1725-4	27.0	28.0	49.5	50.0	50.0	52.5	32.4	33.8	42.2	43.5
ND1995-1	18.5	24.5	48.0	52.5	49.5	44.5	31.5	33.3	38.7	40.5
ND2008-2	28.0	32.5	53.5	48.5	54.0	54.0	30.3	32.2	45.1	45.0
ND2141-4Russ	11.0	11.5	30.0	28.5	26.5	25.0	29.0	30.0	21.7	21.7
ND2264-7	32.5	33.5	43.0	40.5	43.5	48.0	32.9	32.5	39.7	40.7
ND2417-6	17.5	22.0	33.0	41.0	40.0	48.0	31.0	33.7	30.1	37.0
ND2471-8	26.5	20.0	46.0	50.0	54.0	54.0	35.1	33.7	42.2	41.3
ND2642-8	31.0	33.5	49.0	51.0	50.5	58.5	33.0	33.2	43.5	47.7

¹ Chipped on 12/18/90.

² Chipped on 12/20/90.

³ Chipped on 1/2/91.

⁴ Chipped on 1/3/91.

⁵ Chipped on 1/15/91.

⁶ Chipped on 1/17/91.

North Dakota Table 6. Average Scores for French Fries and Flake Tests - 1991.

Cultivar or Selection	French Fries			Flakes		
	Color	Texture	Flavor	Color	Texture	Flavor
NorKing Russet	7.65	7.27	7.13	7.39	6.70	6.96
Frontier	4.59	5.46	4.98			
Shepody	7.55	6.77	6.44			
Russet Burbank	5.60	5.80	5.40			
Russet Norkotah	5.66	5.64	5.11	6.38	6.38	5.95
ND671-4Russ	7.64	6.91	7.11	7.35	7.30	7.31
ND1538-1Russ	6.39	6.94	6.44			
ND2358-20Russ	7.04	5.61	5.82			
ND2667-9Russ	6.75	5.93	5.32			
ND2829-8Russ	7.15	6.81	6.28			
ND2973-10Russ	7.57	6.81	6.52			
ND3059-1Russ	7.01	5.68	5.96			
AT9-77259B-8Russ	7.14	6.85	6.68			
Ore-Ida Check	6.73	6.05	5.63			
Simplot Check	3.44	5.00	3.89			
Norchip				7.54	7.02	7.34
ND2008-2				7.23	7.24	6.95
ND1995-1				7.08	7.07	6.46
ND2417-6				7.72	6.61	6.85
ND2471-8				6.40	5.55	6.11

Rating Guide 7-9 Good
 5-6 Fair, but acceptable
 1-4 Poor, not acceptable

OHIO

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INTRODUCTION

The purpose of the statewide potato variety trials is to test new varieties for the benefit of Ohio growers when these varieties are grown under various farm conditions. Cultural and pest control practices in each case are those used by the cooperating grower. Stand, vigor, plant characteristics, diseases, and maturity were recorded in the fields. At harvest the tubers are evaluated, weighed, and graded, with samples taken for chipping tests.

Eleven cultivars were planted at each of three farms in 1991. These farms were selected to give different soil and climatic conditions. The cultivars were selected either because they looked promising in previous statewide trials, and in the previous observation trials on two cooperating farms, or were selected from the cultivar plots at the Ohio Agricultural Research and Development Center (OARDC), Wooster.

Farm Locations The three farms referred to in the introduction are as follows:

Farm 1 (M) - Michael Farms, Urbana, Champaign County, (Irrigated)

Farm 2 (L) - Logan Farms, Mt. Gilead, Morrow County, (No irrigation)

Farm 3 (W) - Ohio Agric. Research and Dev. Center (OARDC), Wooster, Wayne County, (No irrigation)

See Table 1 for summary of cultural practices followed on these cooperating farms--planting dates, harvest dates and related information.

PROCEDURES

Eleven cultivars were planted in four replicates on each of the three farms. Sixty seed pieces were planted in each replicate. Four additional cultivars were planted in three replications as observation plots at OARDC, Wooster.

The seed potatoes were cut and treated on May 2 and 7. Farm 1 was planted on May 5, Farm 2 was planted on May 16 and Farm 3 was planted on May 15. All were harvested from September 25 to October 2, 1991. The potatoes were harvested with flat bed diggers, then picked up and weighed. A sample of each cultivar was taken to The Ohio State University pilot plant (Columbus) for chip tests. Representative 40 pound samples were collected, then graded October 23 with 10 tubers cut for internal defects. Atlantic, Katahdin and Superior were standard varieties used for comparison.

WEATHER AND GROWING CONDITIONS

The 1991 growing season was extremely hot and dry. See Table 2 for specific data.

FIELD OBSERVATIONS

The average percent stand at Farm 1 was 80%; Farm 2 was 72%; and Farm 3 was the highest with an average of 83% (Table 3). However, Farm 1 had the highest yields at harvest. The average percent stand for all three locations was 78%; one of the lowest on record.

Ohio potato growers experienced one of the most difficult growing seasons in 1991 which has occurred for nearly 50 years. The hot and dry weather during the early part of the growing season affected crop development, especially tuber set and tuber enlargement (later in the season).

For the most part, except where plots were irrigated continuously, the yields in these trials were much lower than previous years. However, several cultivars seemed to have considerable tolerance to both heat and drought.

Gemchip is a round-white tuber with fairly shallow eyes. It seemed to tolerate drought under the conditions of these trials.

Superior, an old variety which is used primarily for early harvest, seemed to tolerate drought and heat surprisingly well. This may be due to the early tuber-setting characteristics of this cultivar.

Katahdin, released by USDA nearly sixty years ago, produced excellent tubers which were quite uniform in appearance and size. Perhaps the tolerance of this cultivar to high temperatures and drought conditions may help to explain the survival of this cultivar for these many years.

Castile is an oval to long-shaped tuber with a white appearance. It seems to have considerable yielding ability under stressful conditions. Bruising at harvest may be a major problem due to shape of the tubers. The plant growth during the season was excellent. More trials are needed before growers can plant on an extensive basis.

Snowden has been included in the Ohio trials since 1986. The tubers are round and have a fairly heavy netting. The plants tend to set many tubers. As a result, tuber size has been small, but tubers have been very uniform. There is considerable interest in this cultivar for chips. It may have a place as a fresh market variety when irrigation is available. Planting distances should be at least 12 inches between seed pieces.

In summary, many new cultivars are being released. Growers should make an effort to plant a small plot of these promising new cultivars which are mentioned in this report.

GRADES AND YIELDS

The following tables present yield information as well as grades and defects. Low yields this year are due largely in part to the hot, dry weather during the growing season. The average total yields for the three locations ranged from 216 to 322 cwt/A. However, Farm 1 had total yields ranging from 314 to 549 cwt/A. The average percent U.S. number 1's ranged from 81 to 93%.

SOIL ANALYSES OF STATEWIDE TRIAL PLOTS - 1991

Test Results	-----Cooperating Farms-----		
	1(M)	2(L)	3(W)*
pH	6.9	5.7	
P (lb/A)	484	196	
K (lb/A)	872	451	
CA (lb/A)	4270	2830	
Mg (lb/A)	827	451	
CEC (meq/100g)	15	13	
Ca (% base sat.)	70	54	
Mg (% base sat.)	23	14	
K (% base sat.)	7.3	4.4	
Zn (lb/A)	29.6	12.0	
B (lb/A)	1.5	.9	
OM (%)	4.1	3.1	
Mn (lb/A)	54	85	
Fe (lb/A)	97.2	102.6	
Zn (lb/A)	29.6	12.0	
Cu (lb/A)	2.7	26.8	
B (lb/A)	1.5	.9	
N ₀₃ N (lb/A)	55	85	

Cooperating Farms:

- 1 = Michael Farms, Urbana
- 2 = Logan Farms, Mt. Gilead
- 3 = Ohio Agricultural Research and Development Center, Wooster

Soil analyses conducted at Research-Extension Analytical Lab, The Ohio Agricultural Research and Development Center, Wooster.

* Soil samples were not collected at Wooster

Table 1. Cultural and pest control practices used on Ohio statewide potato trials – 1991.

	<u>Farm 1 (M)</u>	<u>Farm 2 (L)</u>	<u>Farm 3 (W)</u>
Date planted	May 8	May 16	May 15
Date harvested	September 26	September 25	October 2
1990 crop	Cabbage	Rotation corn	Potatoes
Cover crop	Rye	Corn stalk	
Fertilizer	1000 lbs.	lbs. 150–200–200	1200 lbs.
applied in row	12–30–21	75#N, 200#P	10–20–20
sidedressed	Urea	175K, 80S, Mg15#	
		75# 28%N w/ Lorax	
Herbicide	Dual, Sencor	Dual, Lorox	Dual, Sencor
Insecticide systemic	Phorate	Phorate	Penncap, Ambush, Guthion
Spacing	8" X 36"	8" X 36"	12" X 36"
Soil type	Silt loam	Brookston silt loam	Wooster silt loam
Soil conditions at planting	Excellent	Excellent w/ clods	Excellent
Irrigation	Yes	No	No

Table 2. Stand counts for Ohio statewide main trials and observational trial, 1991.

<u>MAIN TRIALS</u>				
---Cooperating Farms---				
	1(M)	2(L)	3(W)	
<u>Cultivar*</u>	<u>-----% Emergence-----</u>			<u>Mean</u>
MS 700-70	87	75	72	78
Snowden	85	79	82	82
Gemchip	76	73	75	75
Superior	88	82	89	86
Allegany	73	64	78	72
Atlantic	87	73	88	83
Norwis	88	67	92	82
AF 1060-2	65	62	73	67
Katahdin	80	77	87	81
Castile	76	77	92	82
S-3	71	65	83	73
Farm Mean	80	72	83	78
<u>OBSERVATION TRIAL</u>				
MN 13055			71	
Kanona (NY 71)			83	
W 1000			84	
Sangre			72	
Farm Mean			78	

* Some cultivars listed in this report were included as numbered lines in earlier reports, for example:

Snowden -- W855
 Gemchip -- BR7093-24
 Allegany -- N.Y.72
 Norwis -- FL657
 Castile -- B7592-1

Table 3. Rainfall and irrigation records for Ohio statewide potato trial plots – 1991.

	<u>Farm 1 (M)</u>	<u>Farm 2 (L)</u>	<u>Farm 3 (W)</u>
Date planted	May 8	May 16	May 15
Date harvested	September 26	September 25	October 2
	<u>Rainfall/Irrig.</u>	<u>Rainfall</u>	<u>Rainfall</u>
	<u>(inches)</u>	<u>(inches)</u>	<u>(inches)</u>
May	3.5	3.56	2.58
June	4.0	1.34	1.67
July	5.5	2.49	0.86
August	5.5	2.61	3.07
Season Total	18.5	10	8.18
June/July/August Total	15.0	6.44	5.6
Ave. U.S. No. 1 Yields:			
Main Trials (Cwt/A)	401	172	133

Table 4. Percent of B's, culls, and hollow hearts for main trial cultivars.
Results are the mean values for three farms, 1991.

<u>Cultivar</u>	<u>% B's</u>	<u>% Culls</u>	<u>Internal Defects</u> <u>% Hollow</u> <u>Heart</u>
MS700-70	1.3	5.1	2.5
Snowden	5.0	5.9	0.8
Gemchip	3.1	8.4	0
Superior	5.2	4.7	0
Allegany	4.0	6.3	0
Atlantic	3.0	4.2	0.8
Norwis	2.5	7.7	0
AF1060-2	3.9	10.4	0
Katahdin	3.5	8.3	0
Castile	5.8	7.0	0
S-3	1.7	16.6	0
Mean	3.5	7.7	0.4

Table 5. Total yield, percent U.S. No. 1 and marketable yield for main trial potato cultivars, Ohio statewide trials - 1991.

Cultivar	----Farm 1 (M)-----			----Farm 2 (L)-----			----Farm 3 (W)-----			----Mean of 3 Farms--		
	Yield	No. 1		Yield	No. 1		Yield	No. 1		Yield	No. 1	
	cwt/A	%	cwt/A	cwt/A	%	cwt/A	cwt/A	%	cwt/A	cwt/A	%	cwt/A
MS 700-70	476	95	452	230	95	218	143	90	129	283	93	263
Snowden	438	94	412	192	92	177	165	74	122	265	87	231
Gemchip	498	95	473	173	92	159	142	69	98	271	85	230
Superior	314	93	292	161	89	143	197	86	169	224	89	199
Allegany	394	91	359	164	91	149	89	84	75	216	89	192
Atlantic	433	97	420	225	94	212	200	83	166	286	91	260
Norwis	408	92	375	187	90	168	164	86	141	253	89	225
AF 1060-2	437	88	385	173	87	151	188	78	147	266	84	223
Katahdin	419	92	385	200	89	178	134	79	106	251	87	218
Castile	455	96	437	188	80	150	178	84	150	274	87	238
S-3	549	76	417	214	89	190	204	78	159	322	81	238
Mean	438	92	401	192	90	172	164	81	133	265	87	229

Table 6. Mean U.S. No. 1 yields in cwt. per acre for major entries in the Ohio statewide potato trials of all farms each year grown in the last ten years and grown more than one year.

Cultivar	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
<u>Early & Med. Early</u>										
Jemseg	300	161								
Superior							131		207	224
Conestoga		141	230	266	321	225				
Rus. Norkotah					302	272	105			
<u>Early Midseason</u>										
Crystal										
Langlade (W718)	373						181	188		
Norchip	274	184	208	228	301	236	160	161	235	
<u>Midseason</u>										
Snowden (W855)								167		231
LA01-38 (LaBelle)				359	413	330	233	211	272	
Katahdin	341	238	315	335	363	276	187	178	246	251
Atlantic								193	260	260
<u>Late</u>										
Castile (B7592-1)								191		280
Allegany (N.Y. 72)							213	184		192
Denali	311	206								
Elba (NY59)	388	245			393					
Neb. A129-69-1	327	207	278							
WNC521-12				325	344					
MS700-70					378	281	232	187	230	263
Gemchip (BR7093-24)									268	230
Steuben (NY81)							235	215		

Some of the cultivars grown in Ohio for which the characteristics are well known after several years of testing have been omitted in later years. Some cultivars listed were included in the trials prior to the last ten years. Among these are Shurchip, Monona, Kennebec, Atlantic, Crystal, Sebago, Red Pontiac, Red LaSoda, etc. Katahdin, Norchip and Superior are well known and used as standards for comparison.

Table 7. Specific gravity, chip color, percent blister, and Agtron E-5F readings of potato cultivars grown at three farms in statewide trials, 1991.

Cultivar	Farm 1 (M)				Farm 2 (L)				Farm 3 (W)			
	Specific Gravity	Chip Color y	Blister % z	Agtron	Specific Gravity	Chip Color	Blister %	Agtron	Specific Gravity	Chip Color	Blister %	Agtron
MS700-70	1.079	2	0	57.3	1.079	2	10	55.8	1.078	2	30	62.1
Snowden	1.076	1	40	66.3	1.085	2	30	55.2	1.087	1	40	72.2
Gemchip	1.068	3	30	45.5	1.077	3	30	53.8	1.073	1	30	64.0
Superior	1.078	2	10	55.0	1.081	3	30	46.6	1.091	1	20	61.5
Allegany	1.080	1	0	65.3	1.083	1	10	67.5	1.078	1	20	61.4
Atlantic	1.081	1	30	69.5	1.090	1	0	63.4	1.092	1	0	70.0
Norwis	<1.065	1	10	63.3	1.067	1	10	67.3	1.078	1	10	70.8
AF1060-2	<1.065	4	20	35.4	1.070	3	60	46.4	1.078	3	20	49.7
Katahdin	1.075	3	20	54.1	1.068	3	20	44.7	1.065	1	40	68.0
Castile	1.074	3	10	52.2	1.080	2	50	55.0	1.078	2	30	54.2
S-3	1.076	2	0	60.3	1.088	3	20	48.1	1.086	1	30	63.6
Farm Mean	1.074	2.1	15.4	56.7	1.079	2.2	24.5	54.9	1.080	1.4	24.5	63.4
-----Mean of 3 Farms-----												
Cultivar	Mean of 3 Farms											
	Specific Gravity	Chip Color	Blister %	Agtron	Specific Gravity	Chip Color	Blister %	Agtron	Specific Gravity	Chip Color	Blister %	Agtron
MS700-70	1.079	2	13.3	58.4								
Snowden	1.083	1.3	36.7	64.6								
Gemchip	1.073	2.3	30	54.4								
Superior	1.083	2	20	54.4								
Allegany	1.083	1	10	64.7								
Atlantic	1.088	1	10	67.6								
Norwis	1.070	1	10	67.1								
AF1060-2	1.071	3.3	20	43.8								
Katahdin	1.069	2.3	26.7	55.6								
Castile	1.077	2.3	30	53.8								
S-3	1.083	2	16.7	57.3								
Mean	1.078	1.9	20.3	58.3								

y PC/SFA Standards; 1=light (high Agtron index readings), 5=dark (low Agtron index readings)
z Percentage of chips that develop blisters > 20 mm in diameter during the frying process.

Observation Trials (Wooster) Table 1. Total yields, U.S. No. 1 yields, grade distribution, tuber data and internal disorders for observation entries, 1991.

Cultivar	Yield Cwt/A	Total No. 1 Cwt/A	U.S.		z						y					
			No. 1	B size	U.S.	Culls	Tuber Data			Internal Disorders						
							Tuber Color	Skin Texture	Tuber Shape	Eye Depth	Overall Appearance	Internal Necrosis	Hollow Heart	Vascular Discoloration	Defect Free	
MN13055	125	99	79	15		6	2.0	6.0	3.0	5.0	5.0	0	0	0	10	
Kanona (NY71)	114	75	66	27		7	6.7	6.0	2.5	6.0	5.7	0	0	0	10	
W1000	139	114	82	12		6	6.7	5.0	2.0	6.0	6.0	0	0	0	10	
Sangre	118	68	58	20		22	1.5	6.0	2.0	6.5	5.0	0	0	0	10	

z Tuber Data Rating System

Tuber Color: 1) purple 2) red 3) pink 4) dark brown 5) brown 6) tan 7) buff 8) white 9) cream

Skin Texture: 1) part. russet 2) heavy russet 3) mod. russet 4) light russet 5) netted 6) slight net. 7) mod smooth
8) very smooth

Tuber Shape: 1) round 2) mostly round 3) round to oblong 4) mostly oblong 5) oblong 6) oblong to long 7) mostly long
8) long 9) cylindrical

Eye Depth: 1) very deep 2) deep 3) deep 4) intermediate 5) shallow 6) shallow 7) shallow 8) very shallow

Appearance: 1) very poor 2) poor 3) poor 4) fair 5) fair 6) good 7) good 8) excellent 9) excellent

y Hollow heart and internal necrosis ratings indicated the number of affected tubers found per 10 tubers sampled.

OHIO (continued)
NE-107

Introduction: Twenty-seven varieties and clones were tested in 1991 at the Ohio Agricultural Research and Development Center, Wooster, as part of the NE-107 Regional Project (Breeding and Evaluation of Potato Clones for the Northeast).

Methods: Plots were planted on May 15, 1991, with 30 hills spaced 12 inches apart, in rows 36 inches apart. A randomized complete block design with 4 replications was used. Soil type was a Wooster silt loam (fine-loamy, mixed, mesic Typic Fragiudalf) with a pH of 6.0 and an organic matter of 3.0%. Fertilization consisted of 1200 lbs/A 10-20-20, one-half applied at plow-down, and the remainder banded at planting. Herbicides used were Dual and Sencor. Pesticides included Bravo, PennCap, Dithane, Ambush, and Guthion. Plots were vinekilled on September 4 which was 112 days after planting. All plots were mechanically harvested on October 2, 1991. Chip samples were stored at 52°F and chipped 44 days after harvest. Chip color was evaluated using the standards established by the Potato Chip/Snack Food Association (PC/SFA). Objective color measurements were made with the Agtron E-5F. Specific gravity was determined using the potato hydrometer method. Hollow heart and internal necrosis ratings (Ohio Table 2) indicated the percent of affected tubers found per 20 tubers examined.

Results: Top yielding entries included AF1060-2, NYE55-27, B9792-8B, AF875-15, Atlantic, Norchip, NY85, Russet Norkotah, Prestile, and B0241-8. These ten varieties/clones produced total yields ranging from 162 cwt/A to 235 cwt/A, and percentage of U.S. No. 1 ranged from 50-85%. Potential for internal necrosis was noted for three of the ten top-yielding entries (Atlantic, Norchip, and B0241-8) with a range of 20-70% of the 20 sampled tubers affected.

Early blight readings were not made due to lack of disease pressure. Rainfall during the 1991 growing season was only 60% of the long-term average for Wooster. Lack of irrigation and above normal temperatures throughout the summer reduced yields and triggered high levels of internal necrosis in several varieties.

**TUBER DATA RATING SYSTEM FOR
POTATO VARIETY TRIALS – NE 107**

Tuber Skin Color

1. Purple
2. Red
3. Pink
4. Dark Brown
5. Brown
6. Tan
7. Buff
8. White
9. Cream

Skin Texture

1. Part. russet
2. Heavy russet
3. Mod. russet
4. Light russet
5. Netted
6. Slight net.
7. Mod. smooth
8. Smooth
9. Very smooth

Tuber Shape

1. Round
2. Mostly round
3. Round to oblong
4. Mostly oblong
5. Obl. to long
7. Mostly long
8. Long
9. Cylindrical

Eye Depth

1. VD
2. --
3. D
4. --
5. Intermediate
6. --
7. S
8. --
9. VS

Appearance

1. Very poor
2. --
3. Poor
4. --
5. Fair
6. --
7. Good
8. --
9. Excellent

PLANT RATING SYSTEM

Plant Type

1. decumbent–poor canopy
2. decumbent–fair canopy
3. decumbent–good canopy
4. spreading–poor canopy
5. spreading–fair canopy
6. spreading–good canopy
7. upright–poor canopy
8. upright–fair canopy
9. upright–good canopy

Air Pollution

0. dead
1. decreasing plant appearance
2. with varying degrees
3. of defoliation
- 4.
5. most leaves have symptoms, but generally appearance is still good
6. good plant condition with decreasing
7. percent of foliar symptoms
- 8.
9. no symptoms

Plant Size

1. very small
2. +
3. small
4. +
5. medium
6. +
7. large
8. +
9. very large

Plant Maturity

1. very early
2. early
3. +
4. medium early
5. medium
6. medium late
7. +
8. late
9. very late

Plant Appearance

1. very poor
2. poor
3. +
4. --
5. fair
6. +
7. --
8. good
9. excellent

Ohio NE107 Table 1. Yield, marketable yield, percent of yield by grade size distribution and specific gravity for varieties grown at Wooster, Ohio – 1991.

Variety	Total Yield Cwt/A	Marketable Yield		Size Distribution by Class (% of Total Yield)			Specific Gravity
		U.S. #1's Cwt/A	% of STD	U.S. No. 1 (>1-7/8")	B Size	Culls	
B0257-3	156	115	95	74	21	5	1.093
NYE55-27	200	153	126	77	15	8	1.098
Somerset	155	126	104	81	5	14	1.086
Steuben	141	124	102	88	2	10	1.075
Russet Norkotah	166	133	110	80	12	8	1.081
AF828-5	157	131	108	84	4	12	1.082
Norchip	179	124	103	69	13	18	1.087
B0241-8	162	136	112	84	9	7	1.088
NYE55-35	133	106	88	80	7	13	1.095
F100-1	111	93	77	84	8	8	1.088
B9792-8B	206	102	84	50	18	32	1.093
LaBelle	159	122	101	77	5	18	1.081
NY84	129	102	84	79	8	13	1.074
NY85	173	147	121	85	4	11	1.094
Kennebec	155	105	87	68	8	24	1.074
AF875-15	203	144	119	71	7	22	1.087
Chaleur	90	83	69	92	1	7	1.072
Allegany	101	56	46	55	14	31	1.076
NYE55-44	141	123	102	88	2	10	1.070
B9955-46	141	120	99	85	3	12	1.082
NYE11-45	134	113	93	85	6	9	1.065
AF1060-2	235	147	121	63	12	25	1.076
Katahdin (std)	147	121	100	83	35	12	1.071
NYE57-13	132	100	83	76	15	9	1.083
Gemchip	158	111	92	71	17	12	1.075
Atlantic	192	163	135	85	5	10	1.098
Prestile	165	132	109	80	3	17	1.077
W.D. LSD (K=100;5%level)	38.1			19.3			

Ohio NE107 Table 2. Tuber shape and appearance, hollow heart ratings, internal necrosis ratings and chip color for varieties grown at Wooster, Ohio – 1991.

Variety	Vine Data ---at vinekill---		Tuber Data ^z ---Tuber Data---		Hollow Heart %	Internal Necrosis %	y Chip Color
	Plant Size	Maturity	Shape	Appear- ance			
BO257-3	6.7	5.5	2	7	0	0	2
NYE55-27	7.2	6.2	3	5	0	0	1
Somerset	5.9	8.2	4	8	0	0	1
Steuben	7.7	8.2	3	5	0	10	1
Russet Norkotah	7.9	6.9	6	5	0	0	2
AF828-5	6.2	6.7	3	5	0	30	1
Norchip	6.9	5.4	3	6	0	20	1
BO241-8	7.6	7.5	3	5	0	20	1
NYE55-35	6.9	8.2	2	6	0	80	1
F100-1	6.6	6.4	4	6	0	0	1
B9792-8B	8.5	8.7	2	5	0	0	2
LaBelle	6.5	8.6	3	6	0	0	2
NY84	7.4	7.7	3	8	0	0	2
NY85	7.1	5.7	3	6	0	0	1
Kennebec	8.1	7.9	5	5	0	0	2
AF875-15	6.1	5.5	3	6	0	0	1
Chaleur	4.7	5.7	2	8	0	0	3
Allegany	9.0	9.0	2	4	0	0	1
NYE55-44	7.5	7.1	2	6	0	0	1
B9955-46	6.2	8.0	3	6	5	5	1
NYE11-45	7.6	6.5	3	6	0	0	1
AF1060-2	7.5	6.6	2	6	0	5	2
Katahdin (std)	7.1	7.5	3	7	0	35	1
NYE57-13	7.5	7.5	2	6	0	0	1
Gemchip	7.1	8.1	2	6	0	5	2
Atlantic	6.7	7.1	2	6	0	70	1
Prestile	8.5	8.6	3	6	0	0	2

z See standard NE 107 rating system

y PC/SFA standards

Ohio NE107 Table 3. Plant stand, plant type, plant appearance, air pollution, percent blister, Agtron readings, and additional tuber data for varieties grown at Wooster, Ohio – 1991.

Variety	% Plant Stand	Plant Type	Plant Appearance	Air Pollution	z % Blister	Agtron E-5F	y -----Tuber Data-----		
							Skin Texture	Eye Depth	Skin Color
B0257-3	95	6.0	8.5	9.0	40	55.9	6.0	6.0	7.0
NYE55-27	82	6.5	6.6	9.0	30	69.5	4.5	6.5	5.3
Somerset	79	8.2	7.6	9.0	30	66.6	7.0	7.0	7.0
Steuben	53	8.7	7.9	8.7	0	67.7	5.0	5.3	5.0
Russet Norkotah	91	8.7	8.0	9.0	10	55.3	3.0	7.0	4.0
AF828-5	76	7.5	7.9	9.0	20	67.6	7.0	10.0	6.8
Norchip	88	6.0	8.2	9.0	10	66.3	7.0	7.0	6.8
B0241-8	82	7.0	7.1	9.0	10	65.7	5.5	6.8	5.8
NYE55-35	48	6.0	6.1	9.0	0	64.8	5.0	7.0	6.0
F100-1	72	7.5	7.2	9.0	40	65.7	6.0	7.0	6.0
B9792-8B	88	8.7	8.6	9.0	40	57.3	6.0	6.5	5.8
LaBelle	66	5.5	7.2	9.0	30	56.9	6.0	5.5	6.8
NY84	73	7.7	7.2	9.0	30	54.6	7.0	6.0	7.0
NY85	82	6.0	8.6	9.0	10	67.8	5.5	7.0	6.8
Kennebec	82	9.0	8.4	9.0	20	56.7	7.0	6.0	7.0
AF875-15	82	5.1	6.5	9.0	20	66.7	6.0	5.8	6.5
Chaleur	74	4.1	4.9	9.0	30	52.8	7.0	6.8	7.5
Allegany	80	9.0	8.7	9.0	0	70.6	5.5	6.0	6.0
NYE55-44	74	7.7	7.0	7.0	40	67.1	6.0	7.0	6.3
B9955-46	68	5.6	6.5	9.0	30	66.1	7.0	5.3	7.0
NYE11-45	66	8.1	6.9	9.0	10	59.5	7.0	7.0	7.5
AF1060-2	89	7.5	7.2	9.0	0	59.5	7.0	7.0	7.0
Katahdin (std)	82	6.0	7.1	9.0	30	66.1	7.0	6.0	7.0
NYE57-13	77	8.7	7.6	9.0	20	65.7	6.0	6.5	7.0
Gemchip	65	5.5	7.4	9.0	40	56.6	7.0	6.0	6.5
Atlantic	81	6.0	8.1	9.0	30	66.0	5.0	6.0	5.5
Prestile	78	8.2	7.5	9.0	20	55.4	6.0	6.0	6.8

z See standard NE 107 rating system

y Percentage of chips that develop blisters greater than 20 mm in diameter during the frying process

Table 1. (Fremont) Plant stand, total yields, U.S. No. 1 yields, grade distribution, specific gravity and internal disorders for Fremont entries, 1991.

Cultivar	Total Yield Cwt/A	U.S. No. 1 Cwt/A	U.S. No. 1	B Size -----%	Culls	Specific Gravity	% Blister	Chip Color	Agron E-5F	Internal Disorders			Z
										Hollow Heart	Internal Necrosis		
Eide Russet	109	88	81	12	7	1.079	40	4	35.1	0	0	0	
BO220-14	163	109	67	15	18	1.079	10	2	57.0	1.25	0	0	
Coastal Russet	112	75	67	29	4	1.072	30	3	35.5	0	0	0	
ND1538-1Russ	158	96	61	35	4	1.077	20	3	47.3	0	0	0	
MS401-1	125	88	70	26	4	1.080	10	2	58.6	1.25	0	0	
Frontier Russet	140	92	66	28	6	1.082	10	2	61.5	0	0	0	
Russet Norkotah	134	94	70	27	3	1.068	40	4	33.9	0	0	0	
LA12-59	86	62	72	21	7	1.089	30	2	54.2	0	0	0	
ND2224-5R	93	61	66	30	4	1.065	0	3	36.7	0	0	0	
Sangre	120	90	75	21	4	1.072	20	3	48.8	0	0	0	
Red Norland	143	83	58	38	4	<1.065	30	3	45.3	.25	0	0	
S-3	102	76	75	5	20	1.065	20	2	57.8	.25	0	0	

All data based on 4 reps

z Hollow heart and internal necrosis ratings indicated the average number of affected tubers found in 40 tubers sampled.

PLANTED:	May 28, 1991	HARVEST DATE:	October 9, 1991
FERTILIZER:	1200 lb/A 10-20-20 60 lbs/A N	PLANT SPACING:	Row length 30'; 36 " between rows; 12" spacing within rows
		PEST MANAGEMENT:	Furadan 1 1/2 lbs/1000ft row at planting Guthion 1.06lb/A on July 25 Thiodan 2lb/A on August 18

Texas

J. Creighton Miller, Jr. and Douglas G. Smallwood

Variety Development and Testing

Seedling Program. Approximately 37,000 first-year seedlings, representing 324 families, were grown for selection near Springlake in 1991, and 203 original selections were made from this material. The 1991, first-year seedlings from Texas resulted from crosses made at the Texas Agricultural Experiment Station near Lubbock during the winter of 1989-90. The remainder were obtained from Joe Pavsek in Idaho (9,963), Bob Johansen in North Dakota (8,124) and David Holm in Colorado (4,850). The Texas program also supplied the North Dakota, Idaho, and Colorado programs with second, third and fourth size seedling tubers for selection.

Adaptation Trials. The 1991 growing season was marked by above average temperatures in late May and near normal temperatures in June and July. In general, early season vine growth was above average. On June 23rd, a devastating hail storm occurred, defoliating the plants and severely damaging the stems. However, favorable weather conditions in the following weeks allowed for excellent vine recovery in most cases. The hail damage delayed maturity by about two weeks. The variety and advanced selection trials at Springlake were planted on March 28 and harvested on August 26. Twenty-two russet varieties or advanced selections were tested for their adaptability to Texas conditions (Table 1). The outstanding entries based on total yield and general rating were A 74212-1E, TX 8-1385-12Ru, TX 6-1229-2Ru, Norgold "M", Russet Norkotah and Century Russet. The selection TX 6-1229-2Ru produced a high percentage of greater than 10 ounce tubers and a significantly lower percentage of less than 4 ounce tubers. This selection continues to show promise as a potential new variety. While the performance of the new varieties Ranger Russet and Frontier was not bad, results from this trial do not suggest that they are viable replacement varieties for Norgold Russet or Russet Norkotah. Three entries, TX 8-1385-12Ru, CO 83027-2 and ATX 6-84378-1Ru, produced tubers which were below grade as compared to other entries. The performance of ATX 6-84378-1Ru was disappointing this year. In previous years, however, this selection has demonstrated significant potential as a new variety. This selection may have been more adversely affected by the hail than others.

The outstanding white entries based on total yield and general rating were ATX 7-85404-8W, Atlantic and Snowden (Table 2). Atlantic produced higher specific gravity than all other white entries. The performance of AC 80545-1 and Gemchip was

disappointing this year. The outstanding red entries based on general rating were NDTX 9-1068-11R (Colorado-Holm, Colorado-Worley), Red LaSoda, COTX 8-86146-2R, and NDTX 8-731-1R. The variety All Blue, a blue skin and blue flesh novelty potato, was tested for the first time. It produced a large number of small tubers resulting in low total yield.

In 1989, we undertook a new initiative. Selection was based on vine growth habit and included 375 subclonal variants of Russet Norkotah from two diverse locations to develop superior Russet Norkotah strains which possess stronger vines to resist environmental stresses such as hail and hot, desiccating winds. In 1991, approximately 100 of these selections were tested in Texas and Colorado, with selection this time was based primarily on tuber characteristics and yield. Table 3 contains the results from a trial which consisted of twenty Russet Norkotah strain selections. The outstanding entries based on total yield and general rating included Russet Norkotah #6, #1, #9. These strains as well as Russet Norkotah #12, #11, #3 and #10, performed equal to or better than regular Russet Norkotah. In general, Norkotah strains with upright plant type, greater vigor, and later maturity were higher in both yield and specific gravity.

A strip trial was planted at Springlake. It consisted of eleven potato varieties or strain selections and five promising advanced selections for which sufficient seed was available for strip planting of 300 foot rows (Table 4). On August 19, six randomly selected plots of each entry were harvested. The outstanding entries based on total yield and general rating were Red LaSoda, A 74212-1E, Century Russet, NDTX 8-731-1R, NDTX 9-1068-11R and TX 6-1229-2Ru (Idaho seed source). Based on general rating the outstanding entries were Red LaSoda, A 74212-1E, NDTX 8-731-1R, NDTX 9-1068-11R, TX 6-1229-2Ru (Idaho Seed Source) and Norgold "M". The advanced selection TX 6-1229-2Ru (Idaho and Texas Seed Sources) produced significantly higher yields of greater than 10 oz. tubers than all other entries. This entry produces a small number of tubers per plant; however, the tubers are of large size. Overall, the Texas grown seed of this selection did not perform as well as the Idaho seed. As was the case with the russet trial, the selection ATX 6-84378-1Ru was very disappointing, as it did not perform as well as in years past. The vines of this selection did not recover following the hail. Total yield was reduced and a large percentage of the tubers had growth cracks, which affected the overall tuber grade. This selection generally produces large, uniformly shaped tubers with a heavy russet skin. The performance of the white chipping entries, Atlantic, Gemchip, and Snowden was comparable. All three entries produced a large percentage of round, uniform tubers which were under four ounces. The performance of the two red selections NDTX 8-731-1R and NDTX 9-1068-11R was quite good in comparison to the check varieties Red LaSoda and Viking.

Summarizing results of all trials at Springlake, the most promising varieties or advanced selections were NDTX 8-731-1R, NDTX 9-1068-11R, ATX 6-84378-1Ru, TX 6-1229-2Ru, TX 8-1385-12Ru, A 74212-1E, Century Russet, and COTX 8-86146-2R. Several of the Russet Norkotah strain selections show promise. These include Russet Norkotah #1, #6, and #9. These strain selections are in the early test phase and more testing is needed. Additional testing of these, as well as approximately forty-three Texas Russet Norkotah strain selections will continue in 1992. Century Russet and its early strain selection A 74212-1E continue to show promise for the High Plains industry. Additional information is needed regarding cultural practices specific to Texas-New Mexico growing conditions. Norgold "M" continues to be the most consistent performer of the Norgold Russet strains. The overall performance of ND 1538-1Ru and ND 671-4Ru was disappointing again this year.

Texas Table 1. Total yield, yield of U.S. No. 1 potatoes, average tuber weight, specific gravity, tuber type, skin type and general rating of 22 russet potato varieties or advanced selections grown at Springlake, Texas - 1991.

Variety or Selection	TOTAL YIELD CWT/A	U.S.No.1 Total Yield	Average		Specific Gravity	Tuber Type	Skin Type	General Rating 1/
			U.S.No.1 CWT/A Over 10 oz.	Tuber Weight in oz.				
A 74212-1E	440.1	341.1	116.5	5.6	1.066	Long	Russet	3.6
TX 8-1385-12Ru	439.1	329.1	155.5	6.4	1.064	Oblong	Russet	3.4
TX 6-1229-2Ru	359.9	360.1	184.9	9.1	1.071	Oblong	Russet	4.0
Norgold "M"	389.1	294.6	106.5	6.1	1.068	Oblong	Russet	3.6
Century Russet	379.8	278.8	43.9	5.3	1.070	Long	Russet	3.3
Russet Norkotah	357.8	262.7	66.8	5.5	1.066	Oblong	Russet	3.6
CO 83027-2	349.8	256.8	90.3	6.4	1.068	Oblong	Russet	3.0
Ranger Russet (Neb)	346.5	261.0	62.6	6.0	1.076	Long	Russet	2.9
AC 75430-1	336.9	202.3	14.8	4.5	1.073	Oblong	Russet	3.3
AC 83064-6	297.5	150.7	9.0	4.0	1.059	Oblong	Russet	3.0
AC 83068-1	295.6	198.4	38.4	5.0	1.064	Long	Russet	3.1
AC 83064-1	270.1	200.1	46.8	5.4	1.061	Oblong	Russet	3.1
AC 83044-1	264.9	143.3	7.1	4.3	1.070	Oblong	Russet	2.9
Krantz	257.5	181.0	24.5	5.3	1.065	Oblong	Russet	2.9
Frontier	250.1	123.9	4.8	4.6	1.070	Oblong	Russet	3.1
CO 80011-5	243.0	133.3	5.2	4.5	1.071	Oblong	Russet	2.9
Ranger Russet (ID)	233.3	166.8	37.4	5.0	1.075	Long	Russet	2.9
AC 83044-2	194.6	101.6	4.8	4.4	1.074	Oblong	Russet	2.8
ATX 8-8681-1Ru	193.9	139.7	27.1	5.6	1.065	Oblong	Russet	3.1
AC 83172-1	177.8	113.3	0.0	4.2	1.077	Oblong	Russet	2.4
ATX 6-84378-1Ru	136.5	81.38	8.7	5.9	1.070	Oblong	Russet	2.9
Russett Nugget	81.6	29.7	0.0	3.6	1.079	Long	Russet	2.0
NDTX 9-1069-4Ru	72.0	38.4	3.2	4.2	1.064	Oblong	Russet	2.8
Average	278.4	190.8	46.0	5.3	1.069			3.1
L.S.D. (.05)	79.8	70.2	47.2	1.1				

1/ 1 = very poor to 5 = excellent

Texas Table 2. Total yield, yield of U.S. No. 1 potatoes, average tuber weight, specific gravity, tuber type, skin type and general rating of 14 red and white potato varieties or advanced selections grown at Springlake, Texas - 1991.

Variety or Selection	TOTAL YIELD CWT/A	U.S.No.1 CWT/A		Average Tuber Weight in oz.	Specific Gravity	Tuber Type	Skin Type	General Rating 1/
		Total Yield	Over 10 oz.					
ATX 7-85404-8W(Id)	308.5	141.7	0.0	4.6	1.069	Oblong	White	3.3
Atlantic	304.9	160.4	12.6	4.6	1.076	Round	White	3.2
NDTX 9-1068-11R *	296.9	179.4	0.0	4.9	1.055	Oblong	Red	3.8
Red LaSoda	294.3	201.0	8.1	5.3	1.054	Oblong	Red	3.5
Snowden *	291.7	98.4	0.0	3.8	1.067	Round	White	3.0
Snowden **	265.2	102.0	0.0	4.4	1.069	Round	White	3.1
COTX 8-86146-2R	261.7	196.5				Oblong	Red	3.7
Snowden (Neb)	241.4	94.9	0.0	4.4	1.065	Round	White	3.2
NDTX 8-731-1R	237.5	164.9	0.0	4.7	1.047	Round	Red	3.7
ATX 7-85404-8W(CO)	223.6	110.7	0.0	4.0	1.068	Oblong	White	3.0
AC 80545-1	198.1	86.8	2.9	3.6	1.064	Oblong	White	2.9
ATX 7-85404-6W	174.9	142.6	16.5	5.6	1.059	Oblong	White	3.0
All Blue	157.8	30.3	0.0	2.7	1.065	Oblong	Blue	2.5
NDTX 9-1068-11R (Neb)	157.5	104.2	0.0	5.3	1.056	Oblong	Red	3.2
Gemchip	156.5	109.4	8.4	3.7	1.064	Oblong	White	3.0
Average	239.0	133.5	4.1	4.6	1.061			3.2
L.S.D. (.05)	100.3	82.7	17.4	1.0				

1/ 1 = very poor to 5 = excellent

* = Seed source: David Holm, Colorado State University, Center, CO.

** = Seed source: Worley Seed, Monte Vista, CO.

Texas Table 3. Total yield, yield of U.S. No. 1 potatoes, average tuber weight, specific gravity, tuber type, skin type and general rating of 20 Russet Norkotah strain selections, as well as Russet Norkotah, grown at Springlake, Texas - 1991.

Variety or Selection	TOTAL YIELD CWT/A	U.S.No.1		Average Tuber Weight in oz.	Specific Gravity	Tuber Type	Skin Type	General Rating 1/
		Total Yield	Over 10 oz.					
Russet Norkotah #6	341.7	295.6	60.0	6.6	1.063	Oblong	Russet	3.8
Russet Norkotah #12	310.7	240.1	11.9	5.7	1.061	Oblong	Russet	3.3
Russet Norkotah #1	309.1	238.5	26.5	5.5	1.062	Oblong	Russet	3.5
Russet Norkotah #9	298.1	244.9	32.6	6.1	1.064	Oblong	Russet	3.5
Russet Norkotah #11	284.9	230.7	38.7	5.8	1.064	Oblong	Russet	3.4
Russet Norkotah #3	281.7	209.4	25.2	5.7	1.064	Oblong	Russet	3.0
Russet Norkotah #10	270.4	208.1	0.0	5.3	1.065	Oblong	Russet	3.0
Russet Norkotah	266.2	199.1	33.6	5.6	1.061	Oblong	Russet	3.3
Russet Norkotah #7	242.6	169.7	16.5	5.3	1.059	Oblong	Russet	2.9
Russet Norkotah #8	242.0	161.3	25.8	4.6	1.061	Oblong	Russet	2.8
Russet Norkotah #14	232.3	187.1	20.0	5.7	1.060	Oblong	Russet	3.0
Russet Norkotah #21	216.5	168.1	13.2	5.2	1.065	Oblong	Russet	3.0
Russet Norkotah #17	204.2	134.2	3.2	4.5	1.061	Oblong	Russet	2.9
Russet Norkotah #13	203.0	150.4	15.2	5.5	1.059	Oblong	Russet	2.8
Russet Norkotah #22	184.6	129.7	2.6	4.5	1.061	Oblong	Russet	2.8
Russet Norkotah #24	182.3	153.3	27.4	6.1	1.058	Oblong	Russet	3.1
Russet Norkotah #6-0	151.3	104.5	0.0	3.9	1.058	Oblong	Russet	2.8
RN Bull-7	140.7	92.6	0.0	4.4	1.055	Oblong	Russet	2.8
Russet Norkotah #5	135.5	71.3	0.0	3.7	1.063	Oblong	Russet	2.4
RN Reg A	131.3	67.1	3.2	4.0	1.054	Oblong	Russet	2.6
Russet Norkotah #20	110.4	54.93	0.0	3.4	1.060	Oblong	Russet	2.2
Average	225.7	167.2	16.9	5.1	1.061			3.0
L.S.D. (.05)	92.1	77.3	28.7	0.9				

1/ 1 = very poor to 5 = excellent

Texas Table 4. Total yield, yield of U.S. No. 1 potatoes, average tuber weight, specific gravity, tuber type, skin type and general rating of 16 potato varieties or advanced selections grown in a strip trial at Springlake, Texas - 1991.

Variety or Selection	TOTAL YIELD CWT/A	U.S.No.1 CWT/A		Average Tuber		Specific Gravity	Tuber Type	Skin Type	General Rating 1/
		Total Yield	Over 10 oz.	Weight in oz.					
Red LaSoda	438.2	335.6	39.5	5.0	1.049	Oblong	Red		3.5
A 74212-1E	436.0	333.0	42.1	5.4	1.061	Long	Russet		3.6
Century Russet	429.1	326.3	47.5	5.1	1.059	Long	Russet		3.3
NDTX 8-731-1R	413.8	338.9	48.0	5.6	1.043	Oblong	Red		3.7
NDTX 91068-11R	396.7	286.8	28.9	5.0	1.048	Oblong	Red		3.8
TX 6-1229-2Ru (ID)	385.5	344.7	182.7	9.3	1.070	Oblong	Russet		3.5
Russet Norkotah	365.8	288.7	38.9	5.4	1.061	Oblong	Russet		3.4
Norgold "M"	355.7	269.1	57.2	5.5	1.051	Oblong	Russet		3.5
Viking	349.9	290.2	15.3	5.9	1.059	Oblong	Red		3.0
Gemchip	341.2	197.8	8.8	4.3	1.060	Round	White		3.0
Snowden	325.3	157.2	0.0	4.2	1.062	Round	White		3.2
Atlantic	317.2	152.5	5.8	4.3	1.068	Round	White		3.2
Frontier	268.4	172.1	1.7	4.6	1.064	Oblong	Russet		3.1
Ranger Russet	265.8	195.4	27.9	5.0	1.069	Long	Russet		2.9
TX 6-1229-2Ru (TX)	248.2	222.2	101.7	7.6	1.065	Oblong	Russet		3.3
ATX 6-84378-1Ru	242.3	174.9	45.6	6.3	1.065	Oblong	Russet		3.3
NDTX 9-1069-4Ru	193.9	138.2	31.7	4.8	1.058	Oblong	Russet		2.8
Average	339.6	248.4	42.5	5.5	1.060				3.3
L.S.D. (.05)	58.7	58.5	34.9	1.4					

1/ 1 = very poor to 5 = excellent

VIRGINIA

S. B. STERRETT and C. P. SAVAGE JR.

Introduction	Trials were conducted at the Eastern Shore Agricultural Experiment Station in Painter, Virginia. These trials are part of an on-going program that evaluates promising clones for fresh market and chipping potential under eastern Virginia growing conditions. Marketable yield, size distribution, vine and tuber characteristics, and freedom from internal and external defects were recorded for these trials.
Methods	Trials were planted on March 25 in single-row plots on a Bojac sandy loam soil. Plots were 25 feet in length with 36 inches between rows and 12 inches between seedpieces. Trials were planted in a randomized complete block design with four replications. Fertilization included 100 lbs N, 43.7 lbs P, and 83 lbs K/A banded at planting, with 50 lbs N/A side-dressed 66 days later. Linuron (0.20 lbs ai/A) and metolachlor (0.75 lbs ai/A) were applied at dragoff. Irrigation (1 inch) was applied May 22, June 5 and June 13. Trials were harvested July 9. Specific gravity was determined by the weight-in-air/weight-in-water method. Chip evaluations were provided by Mr. Steve Molnar, Wise Foods, Berwick, Pennsylvania. Samples were held at ambient air temperature and chipped 2 and 7 days after harvest.
Seasonal Observations	Although planting was delayed 10 days because of rain, emergence was relatively quick and uniform. Rainfall was below normal for April through July (3.12, .83, 2.39, and 2.93, respectively) with high air temperatures in May and June.
Advanced White-skinned Clones	The yield of several clones equalled or exceeded that of Superior. Attractive tubers were noted for AF1476-16, B0564-9, and NY79 with both B0564-9 and NY79 being free of internal and external defects.
Chip Trial	While the yield of several clones was similar to Atlantic, the specific gravity of B0178-30 was also similar with improved chip color. However, internal and external defects of B0178-30 are a concern. Both yield and chip color of B0209-1 were equal to Atlantic, but specific gravity was lower than Atlantic. Because of the uniformity and attractiveness of the tubers, B0209-1 may have fresh market potential.

Russet Trial	Yield and size distribution of B0493-8 were substantially improved over BelRus but the tubers of B0493-8 were somewhat irregular and variable in shape. Adequate tuber size and acceptable tuber appearance continue to be limiting factors in the development of niche markets for russets from this growing area.
Ratings	Vine and tuber ratings were completed using the rating system of the U. S. Department of Agriculture regional project NE107. For vine ratings, maturity: 1 = senesced, 9 = totally green; air pollution: 1 = defoliated, 9 = no visible symptoms. For tuber ratings, shape: 1 = round, 5 = oblong, 9 = very long (cylindrical); size: 1 = very small, 9 = very large; appearance: 1 = very poor, 9 = excellent; skin maturity: 1 = totally peeled during harvest and grading, 9 = skin intact, and tuber defects: 1 = severe, 9 = none. Ratings of heat necrosis made on 20 tubers in the size range 2-1/2" to 3-1/4".
Acknowledgements	We thank Wise Foods, Inc., Berwick, Pennsylvania and Anheuser-Busch Co., Inc., St. Louis, Missouri for their assistance in these evaluations and chip color determinations. We gratefully acknowledge provision of seed by Kathleen G. Haynes, USDA-Beltsville, Robert L. Plaisted, Cornell University, and Alvin F. Reeves, University of Maine.

Virginia Table 1. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity of round-white trial grown for 105 days at Painter, Virginia, 1991.

Clone ¹	Yield		Marketable Yield ²		Size Distribution ²				Specific Gravity ³	Chip Color ⁴	
	>1-1/2"	cwt/A	Percentage of std.		1	2	3	4		(Days After Harvest)	
Atlantic	297	264	116		11	14	55	21	1.083	2	7
Anosta	201	68	30		29	34	36	0	1.074		
Campbell 13	206	170	75		12	13	59	16	1.061		
Dundrum	316	195	86		28	25	42	5	1.067		
Dunluce	258	209	92		18	24	56	2	1.070		
LaBelle	271	245	107		8	13	59	20	1.064		
Sante	168	58	25		29	27	39	4	1.081		
Superior (Std)	270	228	100		12	19	56	14	1.076		
AF1331-2	339	283	124		4	15	60	12	1.076	3	8
AF1426-1	244	214	94		6	6	53	36	1.068		
AF1437-1	289	234	103		15	22	60	4	1.060	3	8
AF1438-5	280	204	89		26	22	46	5	1.064		
AF1475-16	299	282	124		5	9	52	33	1.078	2	8
B0175-20	261	229	100		9	11	62	18	1.087	3	8
B0175-21	286	259	114		8	13	60	18	1.087	3	7
B0241-8	269	244	107		9	9	48	34	1.079		
B0468-20	285	208	91		21	25	48	6	1.071		
B0473-6	253	163	71		34	35	31	0	1.085		
B0564-8	292	213	93		25	24	47	4	1.079		
B0564-9	300	252	111		15	17	56	12	1.076		
NY79	286	266	117		7	9	56	28	1.066		
Norland	277	227	100		15	21	60	4	1.060		
Waller-Duncan											
LSD (k = 100)	40		51								

¹Planted March 25, harvested July 9, 1991.

²Size distribution: 1 = 1.5-1.88"; 2 = 1.88-2.5"; 3 = 2.5-3.25"; 4 = >3.25".

³Determined by weight in air/weight in water method.

⁴Unreplicated samples: 1-4 = acceptable, 5 = marginal, 6 or greater = unacceptable.

Virginia Table 2. Yield, marketable yield, percentage of yield by grade size distribution, specific gravity and chip color of chip trial grown for 105 days at Painter, Virginia, 1991.

Clone ¹	Yield >1-1/2" cwt/A	Marketable Yield Percentage cwt/A	Size Distribution ² by class (%)				Specific ³ Gravity	Chip Color ⁴ Days After Harvest	
			1	2	3	4		3	8
Atlantic (Std)	310	284	8	11	56	24	1.079	3	5
Superior	277	246	9	11	63	18	1.066	4	7
AF1433-4	252	230	9	17	60	14	1.066	4	4
B0178-30	350	294	14	19	56	11	1.078	2	3
B0178-34	301	264	11	15	59	15	1.083	2	4
B0178-35	277	223	18	22	55	4	1.079	3	6
B0209-1	298	290	3	3	39	55	1.074	2	5
B0256-1	288	241	11	16	56	17	1.071	3	7
B0257-12	309	266	14	17	58	11	1.067	5	7
B0554-1	282	233	16	17	57	10	1.072	3	6
B0583-2	275	186	21	19	51	8	1.073	6	9
B0687-14	300	216	24	26	42	8	1.068	3	5
NY87	322	282	13	19	57	12	1.071	3	5
NY88	249	188	25	26	47	3	1.073	2	6
NYH26-2	246	213	13	15	58	15	1.075	4	8
NYH51-9	275	231	16	20	55	10	1.066	3	7
Waller Duncan									
LSD (k=100)	32	36							

¹Planted March 25, harvested July 9, 1991.

²Size distribution: 1 = 1.5-1.88"; 2 = 1.88-2.5"; 3 = 2.5-3.25"; 4 = >3.25".

³Determined by weight in air/weight in water method.

⁴Unreplicated samples: 1-4 = acceptable, 5 = marginal, 6 or greater = unacceptable.

Virginia Table 3. Yield, marketable yield, percentage of yield by size distribution, and specific gravity of russeted trial grown for 106 days at Painter, Virginia, 1991.

Clone ¹	Yield >1-1/2" cwt/A	Marketable Yield		Size Distribution ² by class (%)				Specific ³ Gravity
		cwt/A	Percentage of std.	1	2	3	4	
BelRus (Std)	163	101	100	38	54	8	0	1.076
Eida Russet	142	19	19	37	73	13	0	1.071
Frontier Russet	174	120	119	59	45	3	1	1.073
B0190-9	116	55	54	53	46	2	0	1.071
B0329-10	221	129	128	42	52	6	0	1.080
B0493-8	232	183	181	21	53	23	3	1.072
B0455-8	223	165	163	26	59	15	0	1.074
B0671-22	187	82	81	56	41	3	0	1.083
ND1538-1	188	86	85	65	11	0	0	1.070
Waller Duncan								
LSD (k = 100)	58		53					

¹Planted March 25, harvested July 9, 1991.

²Size distribution: 1 = 1.5-1.88"; 2 = 1.88-2.5"; 3 = 2.5-3.25"; 4 = >3.25".

³Determined by weight in air/weight in water method.

Virginia Table 4. Plant and tuber characteristics and tuber defects for round-white, red-skinned, and russet clones grown at Painter, Virginia, 1991.

Clone	Vine 1			Tuber			Tuber Defects 2				Heat Necrosis # of Tubers	Rating	
	Maturity	Air Pollution	Shape	Appear.	Skin Matur.	Heat Sprout	Sun-burn	Second Growth	Growth Crack				
-----Advanced Round White Trial-----													
Atlantic	6	8	2	7	5	9	9	7	9	14	6	6	
Anosta	4	9	2	4	5	5	9	4	9	2	8	8	
Campbell 13	3	7	3	6	5	9	8	6	9	1	8	8	
Dundrum	8	8	3	5	6	8	8	6	9	0	9	9	
Dunluce	4	7	4	6	6	9	7	7	9	7	6	6	
LaBella	4	8	3	6	5	7	9	8	9	0	9	9	
Sante	8	8	4	3	6	9	9	4	9	0	9	9	
Superior	4	8	3	7	7	9	8	8	9	0	9	9	
AF1331-2	6	6	4	6	7	9	6	8	9	8	5	5	
AF1426-1	7	8	4	4	4	9	9	7	6	0	9	9	
AF1437-1	5	8	2	7	7	9	7	7	8	0	9	9	
AF1438-5	4	8	3	6	7	9	9	8	9	3	8	8	
AF1475-16	4	7	3	7	6	9	9	9	9	2	8	8	
B0175-20	6	8	4	6	5	9	9	7	9	7	7	7	
B0175-21	5	7	4	7	6	9	8	8	8	0	9	9	
B0241-8	5	8	3	5	4	9	9	7	9	4	7	7	
B0468-20	3	6	6	6	6	9	8	7	9	0	9	9	
B0473-6	5	8	3	6	7	9	9	8	8	0	9	9	
B0564-8	4	8	2	6	8	9	8	7	9	0	9	9	
B0564-9	4	6	3	7	7	9	9	9	9	0	9	9	
NY79	4	7	2	7	6	9	9	9	9	0	9	9	
Norland	2	2	3	6	8	9	9	7	9	2	8	8	

Virginia Table 4. (continued)

Clone	Vine ¹			Tuber			Tuber Defects				Heat Necrosis # of Tubers	Rating	
	Maturity	Air Pollution	Shape	Appear.	Skin Matur.	Heat Sprout	Sun- burn	Second Growth	Growth Crack				
-----Chipping Trial-----													
Atlantic	6	8	2	7	6	9	9	9	9	11	6		
Superior	4	9	3	7	7	9	9	9	9	0	9		
AF1433-4	3	6	3	6	5	9	9	9	9	2	8		
B0178-30	6	8	2	6	6	6	8	6	9	2	7		
B0178-34	8	9	3	5	5	9	9	9	9	0	9		
B0178-35	8	9	2	5	5	9	9	9	9	0	9		
B0209-1	6	9	3	7	6	9	9	9	9	0	9		
B0256-1	7	9	2	6	6	7	9	7	9	0	9		
B0257-12	4	7	3	6	6	8	8	8	9	0	9		
B0554-1	5	8	3	6	8	7	8	6	9	3	6		
B0583-2	8	8	3	5	5	6	9	4	9	0	9		
B0687-14	3	8	3	6	6	8	8	5	9	0	9		
NY87	4	9	3	7	5	9	9	9	9	0	9		
NY88	3	7	3	6	6	9	9	9	9	0	9		
NYH26-2	4	8	3	5	5	9	8	8	9	10	8		
NYH51-9	3	8	3	6	5	9	9	9	9	0	9		
-----Russet Trial-----													
BelRus	4	7	6	6	5	9	9	9	9	9	7		
Eida R	6	8	5	5	8	9	9	5	9	0	9		
Frontier R	6	8	6	5	5	9	9	6	9	0	9		
B0190-9	9	8	6	2	5	3	9	2	9	0	9		
B0329-10	3	5	4	2	6	9	9	9	9	0	9		
B0493-8	4	7	6	4	6	9	9	9	9	0	9		
B0455-8	4	7	6	6	6	9	9	9	9	0	9		
B0671-22	4	6	6	3	5	9	9	5	9	1	8		
ND1538-1	5	8	6	2	6	9	9	9	9	0	9		

¹Vine ratings taken 102 days after planting. Norland used as air pollution standard.

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Screening Tuber-
Bearing Solanum
(Potato) Species
Germplasm for
Efficient Accumula-
tion of Tuber
Calcium

Resistance to storage rots and other tuber defects in potato has been correlated to the level of calcium in the peel of the tuber. Increased peel calcium concentration has also been shown to be correlated to improvements in tuber yield and grade. In most soils, calcium movement is very limited. Calcium availability is also limited in soils with low cation exchange capacity, sandy soils with naturally low calcium levels, and soils where the pH is maintained at low levels as a means of controlling scab disease. Different cultivars have been shown to vary in their ability to accumulate calcium, suggesting that this difference has a genetic component. In this study, 21 diverse tuber-bearing Solanum species, including 3 cultivated species, were planted in the greenhouse under conditions which promoted tuber production. The plants were watered with nutrient solutions containing Control (80 ppm) or Treatment (800 ppm) calcium concentrations. Species were evaluated with respect to total calcium ppm of Control-grown tubers (C), and the additional calcium ppm accumulated by tubers grown in the Treatment solution, (T-C). These statistics represented calcium accumulation efficiency in the non-amended condition (C), and ability to utilize supplemental calcium applications (T-C). Some wild species were identified which significantly outperformed cultivated species with respect to both (C) and (T-C). Solanum kurtzianum was the poorest calcium accumulator for both of these parameters, while S. gourlayi was among the best. Solanum gourlayi and S. microdontum exhibited (T-C) calcium accumulation three times that of S. tuberosum ssp. tuberosum. These results suggest that wild Solanum species may be useful when breeding for enhanced calcium accumulation and the associated resistance to tuber rots and defects.

CALIFORNIA

R.E. Voss, K.L. Brittan, J. Guerard, H. Carlson, R. Johansen, J. Pavek

Objectives

1. Obtain or develop new and/or improved russet, white, red, processing and specialty varieties of higher yields and quality.
2. Demonstrate the characteristics of the many new varieties and advanced selections being developed in the U.S.
3. Determine relative resistance/susceptibility of named varieties and advanced selections to powdery scab and Columbia root knot nematode.
4. Maintain a seed increase of selections from this program.

Summary

Replicated yield trials were grown in five locations. Observational trials of varying size (2x27 hill, 27 hill, 12 hill, and 5 hill) were grown at Tulalake and in Kern Counties. A total of 200 russets, 30 chippers, 10 long whites, 60 reds, and 20 specialty clones/varieties were grown. Selected for further evaluation from these trials were 90 russets, 10 chippers, 5 long whites, 45 reds, and 15 specialty types. Emphasis in the California program continues in the area of russets for fresh market, with current emphasis also on reds. The chip industry is in a state of variety transition, thus emphasis in Kern County is also high for these types. Specialty varieties are important to small growers with some large acreage of yellow flesh.

The most promising advanced selections or new varieties that have been tested in California with the best results in 1991 include:

<u>Russets</u>	<u>Chippers</u>	<u>Reds</u>	<u>Long Whites</u>	<u>Specialty</u>
Century Rus.	Chipeta	A82705-1	A76147-2	Yukon Gold
COO83008-1	AD84602-1	A82745-1	A84712-1	Red Gold
CO82142-4	AC83306-1	A83359-5	AD74548-5	Brigus
A083037-10	CS7232-4	AD82706-2	AD84087-1	Rose Gold
NDD840-1	W887	NDA3003-2		
TND329-1	FL1584	ND02904-7		
	NYE55-44	ND03432-3		
		ND03503-5		

Replicated Yield Trial

Two trial locations were used in Kern County. Yields in the russet trial were moderately low, averaging 305 cwt/A total yield, with the range of 385 to 200 cwt/A. Highest yielders were Lemhi, CO82142-4, AO82283-1, AC81198-11, and A82119-3. Highest tuber quality ratings were for Russet Norkotah, ND1538-1, CO81082-1, Century Russet, AO82283-1, and Lemhi. The yields of reds ranged from 385 to 115 cwt/A (Red LaSoda and ND2224-5, respectively). The highest quality rating was by A82405-1. Yield of chip varieties ranged from 525 cwt/A (AD84602-1) to 305 cwt/A (Steuben).

Other high yielders were Chipeta, AD84545-1, CO84111-6, AD81138-12, and AC83306-1. the average total yield was 415 cwt/A. In the national Snack Food Association trial, the yields ranged from 485 cwt/A (CS7232-4) to 245 cwt/A (W870). Other high yielders were Coastal Chip, W887 and Atlantic. The average total yield was 360 cwt/A. The highest specific gravity clones in both chip trials were Atlantic, FL1584, A80559-2, W887, AD84545-1, and Shepody. The range of specific gravity was 1.097 (W887) to 1.071 (CS7232-4), with the average 1.083. Agron color was good for all SFA entries, ranging from 71 (AF875-16, A80559-2, and W870) to 61 (NDA2126-6).

At Tulelake, yields and quality were good. Russet total yields averaged 410 cwt/A and ranged from 590 cwt/A to 85 cwt/A. Highest yielding entries were Century Russet, AO83037-10, Lemhi, COO83008-1, AC81198-11, Russet Burbank and AO82283-1. Highest quality ratings were for Century Russet, AO83037-10, Lemhi, COO83008-1, AO82283-1, A81473-2, and CO82142-4.

Varieties that performed well in other trials in California included A74212-1E, COO83008-1, Century Russet, AO82611-7 at Santa Maria; and Kennebec, AC83306-1, and AD81138-12 at Humboldt County.

Table 1 provides a summary of entries at the various replicated trial locations. Table 2 lists the selections from non-replicated plots.

Table 1
CALIFORNIA
Summary of No. 1 Yields, Tuber Quality and Storageability
Of Standard and Potential Varieties

Intermountain										
Variety	Kern	Kern	SFA	Res. & Ext.	Santa	Humbolt	Adj. Dev.	Specific	Tuber	Tuber
				Center	Maria		From Mean	Gravity	Rating	Storage
										Notes
A. Russets										
A74212-1E					674		308	29	3.5	KN, PE, MS
A81074-2	297						-70	84	3.6	Med. Late, SK
A81473-2	250		366				-59	88	3.5	Good SK, Sl. GC
A82119-3	346		339				-24	89	3.6	Good SK
AC75430-1	267		399		601		56	91	3.1	Excel. Sev. HH, AH
AC78069-17	257		390		611		53	86	3.1	Fair HH, GC, MS
AC811198-11	353		422		443		40	84	3.0	Good HH, AH, RH
AO82283-1	358		415				20	89	3.7	Good SK, HH
AO82611-7	228		383		478		-4	91	3.3	Good PE, GC
AO83037-10	236		492				-2	84	3.6	Excel. Late,
ATX84378-1			396				30	78	3.0	Good HH, AH, GC, Big
Century Russet	304		573		576		118	86	3.6	Fair GC, SK, PE, Big
CO80011-5	335		364		469		23	75	3.2	Poor GC, PE, Med. Late
CO81082-1	251		75		271		-168	81	3.5	Poor Late, RH
CO82142-4	361		291		449		1	87	3.3	Excel. SK, AH
COO83008-1	307		428		582		73	94	3.5	Excel. SK, Deep Eye
Lemhi	365		488				60	93	3.7	Fair KN, Med. Late
MN1087-4					393		27	80	3.0	MS, SK
ND1538-1	259						-108	90	4.1	
ND671-4	176						-191	87	3.0	Sl. GC
Rus. Burbank	339		418			294	-16	87	3.0	Excel. SK, KN, Big, PE
Rus.Norkotah	248		393		436		-7	81	3.6	Vr. Good Sl. GN, MS
Mean	295		379		499	294		83	3.4	
1 AH - Alligator Hide			KN - Knobs				SEV - Severe			
GC - Growth Cracks			MS - Misshapen				SK - Skinned			
GN - Green			PE - Pointed End				SL - Slight			
HH - Hollow Heart			RH - Rough				VD - Vascular			
IN - Internal Necrosis			SC - Scab				Discoloration			

Intermountain										AGTRON	
Variety	Kern	Kern SFA	Res. & Ext. Center	Santa Maria	Humbolt	Adj. Dev. From Mean	Specific Graviety	Tuber Rating	Chip Color	Notes	
B. Chippers/Whites											
A80559-2	299	255				-84	88	3.5	71	Sev. HH, SC, MS	
AC80545-1	438					77	85	3.7	63	SC, SM	
AC83306-1	415				320	7	86	3.7	62	SC	
AD81138-12	425				309	6	90	4.1	60	PE, RH	
AD84545-1	436					75	89	3.3	52	SC, GC, KN	
AD84602-1	501					140	75	3.1	63	SC, MS, KN	
AF875-16	319					-42	76		71		
Atlantic	383					22	90		65	Big	
Castile					272	-89	100	3.8		SC, PE	
CO84111-6	432					71	86	3.9	61	HH, BC, SC, PE, RH	
Coastal Chip		412				51	81		67	SC	
CS7232-4		471				110	71		64	HH, SI, SC	
FL1584		358				-3	90		68	HH	
Kennebec			537		328	72	87	3.5		SC, KN, Big	
MN12823	384					23	85	3.5	63	HH, VD, SC, MS	
NDA2126-6		273				-88	80		61	Sev. IN	
NDO1496-1	353				255	-57	89	3.9	60	SC,KN,RH	
Norchip	361					0	83	3.0	52	PE, KN, MS	
NY87		311				-50	74		64		
NYE55-44		348				-13	85		65		
Shepody	393		305		238	-49	87	3.4	54	SC, MS,HtSP, KN, RH	
Stuben	296					-65	72	3.8	50	SC, SI, GN	
W870		222				-139	90		71	HH	
W887		393				32	74		64		
White Rose	447		411			68	82	3.0		PE, SK, RH	
Mean	398	340	418		287		84	4		62	

Variety	Intermountain									
	Kern	Kern	Res. & Ext.	Santa	Humbolt	Adj. Dev. From Mean	Specific Gravity	Tuber Rating	Tuber Storage	Notes
	SFA	Center	Maria							
C. Reds										
A82705-1	243					-67	84	3.9		SK, Good Color
ND2224-5	94		301	418	153	-68	77	3.6	Poor	SK, SM, Color Fades
NDTX9-1068-11					173	-137	74	4.3	Poor	SC, Sl. Russetting
Red LaSoda	375		463		280	63	82	3.3	Good	Fair Color, SC
Mean	237		382	418	202					

Table 2
CALIFORNIA
Selections From Non-Replicated Observational Plots

Clone	Location	Clone	Location	Clone	Location
Russets		Russets, continued		Russets, continued	
A74212-1E	T-27	AD83034-5	T-27	AO83177-6	K-27
A83043-12	T-5	AD83044-2	T-27	B9596-2	K-12
A84422-3	T-5	AD83053-1	T-27	Calgold	T-27
A84458-9	T-27	AD83053-1	K-12	CD87143-1	K-12
A85027-8	K-12	AD83206-1	T-27	CO83054-4	T-27
A86011-8	T-5	AD83222-1	T-27	CO84074-2	K-27
A86011-10	T-5	AD83224-1	T-27	CO85026-4	K-12
A86011-16	T-5	AD84042-1	K-12	CO85168-4	K-12
A86042-1	T-5	AD84418-1	K-27	COA8456-1	T-27
A86051-1	T-5	AD85103-1	K-27	Coastal Russet	K-27
A86093-13	T-5	AD85345-5	T-5	MN10874	K-27
A86102-6	T-5	AD85356-1	T-12	ND671-4	T-27
A86115-2	T-5	AD85367-2	K-27	ND764-1	K-12
A86321-1	T-5	AD85367-4	K-27	NDA848-3	K-27
A86321-4	T-5	AD85369-1	T-27	NDD2346-3	T-27
AC82052-1	K-12	AD87005-1	T-12	NDD2629-1	T-27
AC82263-1	T-27	AD87070-4	T-12	NDD837-2	T-27
AC82693-4	K-12	AD87147-2	K-12	NDD840-1	T-12
AC83064-1	K-27	AD87167-1	T-12	Russet Burbank	T-27
AC83064-6	K-27	AD87167-3	T-12	Russet Norkotah	T-27
AC83068-1	K-27	AD87460-2	T-12	Sierra	T-27
AC83172-1	K-27	AD88141-1	T-5	Sierra-2	K-12
AC84025-4	T-27	AD88141-2	K-5	TND329-1	K-27
AC84028-4	K-27	AD88162-1	T-5		
AC84487-1	K-27	AD88162-2	T-5		
AC84509-2	K-12	AD88164-1	K-5		
AD81072-2	T-12	AD88164-2	K-5		
AD81870-4	K-12	AD88164-3	K-5		
AD82162-3	T-27	AD88500-1	K-5		
AD83011-5	K-12	AND7430-1	T-12		

Table 2
CALIFORNIA
Selections From Non-Replicated Observational Plots

Selecte elected		Clone		Location	
Clone	Location	Clone	Location	Clone	Location
<u>Reds</u>					
A79543-4	K-27 T-27	<u>Reds, continued</u>			
A82583-1	K-27 T-27	NDO3432-3	K-27 T-27	D. Purple/Blue	
A82705-1	T-27	NDO3503-2	K-27 T-27	Blue Mac	T-12
A82745-1	K-27 T-27	NDO3503-5	K-27 T-27	Brigus	T-27
A83359-5R	K-27 T-27	NDO3504-2	T-12	Kerry Blue	T-27
A83371-2	T-27	NDO3504-3	K-27 T-27	Peru Purple	T-27
A84642-2	K-27 T-27	NDO3573-3	K-27	Purple Chief	T-27
A84650-3	T-27	NDO3573-5	K-27 T-27		
A84651-2	K-27 T-27	NDTX9-1068-11	K-27 T-27		
A84662-1R	K-27 T-27	Red Gold	T-27		
AC82706-2	K-12	Rose Gold	T-27		
AC84638-1	T-27				
AC85438-4	K-12				
AD81560-4	T-27				
AD81567-4	T-27				
AD82706-2	T-27				
AD83222-1	T-27				
AD83224-1	K-27				
AD88473-1	K-5 T-5				
AD88473-2	T-5				
AD88485-1	K-5 T-5				
AD88485-3	K-5 T-5				
CD87092-2	T-12				
CD87154-3	T-12				
COA86147-3	T-27				
COA87154-1	T-5				
F74070	K-27 T-27				
LA12-59	K-27 T-27				
MN13035	T-27				
ND1562-4	K-27 T-27				
NDA3003-1	T-27				
NDO2438-2	K-12 T-12				
NDO2469-1	K-12 T-12				
NDO2469-2	K-12 T-12				
NDO2486-4	K-12 T-12				
<u>C. Whites</u>					
		86SD8-2	T-27		
		A76147-2	K-27 T-27		
		A84369-1	T-27		
		A84712-1	K-27 T-27		
		A86435-17	T-27		
		AC80545-1	T-27		
		AC83306-1	T-27		
		AC83311-2	K-12		
		AC84601-1	K-12		
		AC84610-2	K-12		
		AC84610-5	K-12		
		AD81138-12	T-27		
		AD84087-1	K-27 T-27		
		AD84545-1	T-27		
		AD84602-1	T-27		
		B141	T-27		
		Castile	T-27		
		Fidlund 2	T-27		
		Kufri Jyoti	T-27		
		ND2050-1	T-27		
		Yukon Gold	K-27 T-27		

NEW JERSEY

Melvin R. Henninger

INTRODUCTION

Most trials were conducted at the Rutgers Research & Development Center near Bridgeton, NJ in Upper Deerfield Township. All plots were 21' long and 3' wide. Seedpieces were spaced at 9" for round types and 12" for long types. Six hundred lbs./A of 10-10-10 were broadcast and disk-in before planting. Daul and sencor were applied 15 days after planting. Additional 100 lbs./A nitrogen was topdressed 5 weeks after planting.

Colorado Potato Beetles were troublesome all season. All plots were sprayed seven times with seven different materials and control was o.k. Other insects and diseases were not a problem and did not limit growth. May was hot and dry, which limit tuber set in the early varieties. There was 13.8" of rainfall plus irrigation of 5.8".

All plots were harvested with a single-row mount commercial harvester modified for bagging. No attempt was made to recover any lost tubers caused by normal harvester operation. All plots were sized with a spool sizer and specific gravities were determined by weight in air and water. Chip color was done by Mr. Steve Molnar of Wise Foods.

Two variety trials were conducted at the Snyder Research & Extension Farm near Pittstown in Hunterdon County. This location has well-drained silt loam soils very suitable for potato production. The plot area has not been planted to potatoes for at least 15 years. The fertilizer was broadcast and disk-in before planting at the rate of 100 lbs./A of N - P₂O₅ - K₂O. 50 lbs./A of Nitrogen was topdress when the plants were 2-4" tall. Daul and Sencor were applied one week after planting. Colorado Potato Beetles were not a serious problem. Five sprays were all that was needed. Other cultural and research practices were as described above.

New Jersey Table 1. Yields, Specific Gravities, and Tuber Sizes for 12 Early Harvested Potato Varieties Grown on a Sandy Loam Soil at the Rutgers R & D Center - Bridgeton, NJ 1991 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield cwt/a	% of Sup.	Spec. Grav.	% O v e r			% Culls			% Tuber Sizes (3)				
						1	7/8	2 1/2				1	2	3	4	5
Atlantic	ne	268	234	103	1.087	87	22		1	13	65	21	1	0		
Norland	ne	211	169	74	1.059	80	10		2	20	70	9	1	0		
Reddale	ne	306	282	124	1.060	96	59		6	4	37	50	9	0		
Somerset	ct	235	196	86	1.078	85	16		2	15	69	15	1	0		
Steuben	ne	314	291	128	1.074	93	38		1	7	55	37	1	0		
Sunrise	ct	238	216	95	1.072	90	30		0	10	61	27	3	0		
Superior	ne	254	227	100	1.068	93	25		4	7	68	22	3	0		
Yukon Gold	ne	262	230	101	1.074	88	22		1	12	67	22	0	0		
B0178- 34	us	253	233	102	1.089	94	32		2	6	61	29	3	0		
B0256- 1	us	242	225	99	1.078	95	37		3	5	58	33	4	0		
B0257- 3	us	187	159	70	1.085	88	34		3	12	53	32	2	0		
B0257- 12	us	259	227	98	1.079	89	28		2	11	61	26	2	0		
Grand Mean		252	224	98	1.075	90	29		2	10	60	27	2	0		
CV		15	18		4	5	26									
Bayes LSD .05		57	62		.004	6	10		ns	6	13	12	ns	ns		

(1) All plots were 21' long and 3' wide with 4 replications. Seedpieces were spaced at 9". Commercial cultural practices were used throughout which included sprinkler irrigation. All plots were planted on April 4 and harvested on July 22.

(2) ct = Certified Seed, ne = Sangerville Seed Farm, us = USDA Chapman Farm.

(3) Size 1 = Under 1 7/8, S2 = 1 7/8 TO 2 1/2, S3 = 2 1/2 to 3 1/4, S4 = 3 1/4 TO 4, and S5 = Over 4.

New Jersey Table 2. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for
12 Potato Varieties Harvested Early and grown in Bridgeton, NJ - 1991 (1).

Variety	P L A N T					&		TUBER CHARACTERS					T U B E R										D E F E C T S			OVER	
	T	S	A	A	M	C	T	S	D	A	U	E	S	G	S	H	G	S	H	H	H	N	R	C	C	ALL	
	y	z	p	p	t	l	x	h	p	p	n	y	G	C	S	S	R	B	H								
Atlantic	6	6	7		6	6	7	6	2	8	8	8	8	9	9	2	9	9	9	6	28	7		2	7		
Norland	4	3	3		3	2	2	7	3	7	7	7	8	7	9	7	7	9	9	2	0	9		4	6		
Reddale	6	4	6		4	5	2	8	4	3	6	5	6	8	4	2	9	8	9	3	0	9		3	6		
Somerset	8	6	6		6	5	7	7	5	7	8	7	8	7	7	1	9	9	9	0	0	9		3	7		
Steuben	8	7	8		8	8	8	7	2	8	8	8	8	9	8	3	9	9	9	1	0	9		4	8		
Sunrise	8	6	6		7	5	7	7	3	6	7	7	8	9	9	4	9	8	9	0	0	9		3	7		
Superior	6	6	6		6	5	7	6	5	7	6	6	4	7	6	5	9	9	9	1	1	7		5	6		
Yukon Gold	7	9	7		6	5	8	8	2	6	7	7	8	8	7	1	9	8	9	0	0	9		3	7		
B0178- 34	7	5	6		6	7	7	8	3	6	6	6	7	7	9	2	9	9	9	0	0	9		2	8		
B0256- 1	8	6	6		5	5	7	6	2	8	7	7	8	8	7	3	8	9	9	1	1	7		5	7		
B0257- 3	9	6	7		5	5	8	9	2	8	8	7	8	8	9	2	9	7	9	3	0	9		2	6		
B0257- 12	6	5	6		7	6	8	8	3	8	6	7	9	7	9	3	9	9	9	1	0	9		3	7		

(1) See NJ Rating Table 17 for all plant and tuber characteristics, tubers defects and chip color.

New Jersey Table 3. Yields, Specific Gravities, and Tuber Sizes for 20 Round White Potato Selections Grown on a Sandy Loam Soil at the Rutgers R & D Center - Bridgeton, NJ 1991 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield % of Sup.	Spec. Grav.	% O v e r			% Culls		% Tuber Sizes (3)		
					1	7/8	2 1/2	1	7/8	1	2	3 4 5
Allegany	ne	236	221	72	1.071	93	51	0	7	43	39	12 0
Atlantic	ne	320	296	97	1.086	92	29	0	8	63	29	0 0
Campbell-14	ne	267	241	79	1.077	90	30	0	10	60	30	0 0
Gemchip	ne	273	239	78	1.066	89	32	1	11	57	29	3 0
Katahdin	ne	320	294	96	1.066	93	41	1	7	53	34	6 0
Kennebec	ne	345	272	89	1.072	85	18	6	15	67	16	1 0
Mainechip	ne	263	240	78	1.090	92	14	1	8	78	14	0 0
Somerset	ne	318	283	93	1.079	90	20	1	10	70	18	2 0
Steuben	ne	395	364	119	1.074	95	56	2	5	38	44	13 0
Superior	ne	325	304	100	1.066	95	28	3	5	67	27	1 0
AF 828- 5	ne	335	315	103	1.068	95	48	1	5	46	44	5 0
AF 875-15	ne	284	207	68	1.081	74	20	3	26	54	18	2 0
AF1060- 2	ne	334	271	89	1.072	84	20	3	16	64	19	1 0
AF1303- 1	ne	218	175	57	1.061	78	8	0	22	70	8	0 0
B0178- 34	ne	310	279	91	1.091	90	28	1	10	62	27	2 0
B0256- 1	ne	287	272	89	1.081	95	28	0	5	66	28	0 0
NY E11-45	ne	279	243	79	1.058	87	13	0	13	74	12	1 0
NY E55-44	ne	232	200	65	1.077	86	14	0	14	72	14	0 0
NY 84	ne	332	287	94	1.063	88	30	2	12	58	23	8 0
NY 85	ne	306	276	90	1.081	90	10	0	10	80	10	0 0
Grand Mean		289	251	98	1.073	88	25	2	12	63	23	3 0
CV		12	16		5	8	33					
Bayes LSD .05		48	56		.005	10	11	ns	10	12	9	5 ns

(1) All plots were 21' long and 3' wide with 4 reps. Seedpieces were spaced at 9". Commercial cultural practices were used which included irrigation. All plots were planted on 4/4 and harvested on 8/8.

(2) ne = Sangerville Seed Farm.

(3) Size 1 = Under 1 7/8, S2 = 1 7/8 TO 2 1/2, S3 = 2 1/2 to 3 1/4, S4 = 3 1/4 TO 4, and S5 = Over 4.

New Jersey Table 4. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for
20 Potato Varieties Grown in Bridgeton, NJ - 1991 (1).

Variety	P L A N T				& TUBER CHARACTERS				T U B E R D E F E C T S										OVER	
	T	S	A	A	M	C	T	S	D	A	U	E	S	G	S	H	G	S	H	H
	y	z	p	p	t	l	x	h	p	p	n	y	G	C	S	S	R	B	H	N
Allegany	9	8	8	5	7	8	7	2	7	7	7	6	9	9	4	9	9	9	0	2
Atlantic	6	6	6	6	6	7	6	2	8	8	8	8	9	9	5	9	9	9	2	36
Campbell-14	5	7	7	6	7	8	8	3	8	8	7	8	9	9	5	9	9	9	0	7
Gemchip	6	7	7	7	7	8	7	2	7	7	7	9	8	9	2	9	9	9	0	0
Katahdin	6	7	8	7	8	9	9	2	5	8	7	9	9	7	1	9	9	9	1	6
Kennebec	6	8	8	8	6	9	9	5	6	5	5	7	6	7	2	6	5	9	4	9
Mainechip	7	5	5	5	4	8	7	2	7	7	7	7	9	9	5	9	9	9	2	0
Somerset	6	7	7	7	6	8	8	5	6	7	7	8	8	7	2	9	7	7	0	0
Steuben	9	8	8	7	7	8	6	1	8	8	8	7	9	7	3	9	9	9	1	3
Superior	6	7	7	5	5	7	6	3	7	5	5	5	7	7	9	9	7	9	0	10
AF 828- 5	8	7	7	6	5	8	7	3	5	6	7	8	9	7	3	9	9	9	1	1
AF 875-15	5	6	6	5	6	8	7	2	7	7	6	8	9	7	7	9	9	9	0	0
AF1060- 2	8	7	6	7	7	8	8	3	7	7	8	7	6	7	6	9	9	6	0	2
AF1303- 1	4	4	4	5	2	8	7	3	6	7	7	8	8	9	5	9	9	9	0	0
B0178-34	8	5	7	7	7	7	6	4	7	7	5	7	8	9	2	9	8	9	0	4
B0256- 1	8	6	6	5	5	6	5	2	7	7	7	8	8	9	7	9	9	9	1	1
NY E11-45	7	6	6	4	5	8	7	2	7	7	7	8	9	8	6	9	9	9	0	0
NY E55-44	8	6	5	3	3	6	6	1	8	8	8	8	9	7	7	9	9	9	0	0
NY 84	6	7	7	4	6	8	7	3	6	8	7	8	8	8	5	9	9	9	0	0
NY 85	4	7	6	5	5	8	6	2	6	7	7	7	8	9	6	9	9	9	1	2

(1) See NJ Rating Table 17 for all plant and tuber characteristics, tubers defects and chip color.

New Jersey Table 5. Yields, Specific Gravities, and Tuber Sizes for 21 Round White Potato Selections Grown on a Sandy Loam Soil at the Rutgers R & D Center - Bridgeton, NJ 1991 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (3)				
			cwt/a	% of Sup.		1	7/8	2 1/2		1	2	3	4	5
Atlantic	us	310	295	118	1.079	95	45	0	5	50	39	7	0	
Superior	us	259	248	100	1.064	97	33	1	3	64	31	2	0	
B9792- 8B	us	328	290	116	1.079	95	42	7	5	53	35	7	0	
B9792-158	us	324	286	115	1.072	90	22	2	10	69	21	1	0	
B0174- 16	us	300	274	110	1.086	91	28	0	9	64	28	0	0	
B0175- 20	us	279	262	105	1.085	97	59	3	3	38	48	11	0	
B0178- 30	us	293	262	105	1.079	91	25	2	9	66	24	2	0	
B0209- 1	us	299	292	117	1.075	98	75	1	2	23	43	32	0	
B0241- 8	us	370	348	140	1.073	94	47	0	6	47	39	8	0	
B0257- 3	us	277	255	102	1.081	93	40	1	7	53	33	7	0	
B0257- 9	us	232	225	90	1.075	97	51	0	3	46	41	10	0	
B0257- 12	us	311	287	115	1.076	92	33	1	8	59	31	2	0	
B0564- 6	us	283	159	64	1.068	88	31	32	12	56	30	1	0	
B0564- 8	us	267	240	96	1.072	90	23	0	10	66	20	3	0	
B0564- 9	us	310	296	119	1.073	96	59	0	4	36	43	17	0	
B0583- 2	us	342	292	117	1.079	91	36	6	9	55	34	2	0	
B0583- 8	us	258	220	88	1.082	88	23	4	12	65	21	2	0	
B0585- 5	us	255	246	99	1.073	97	60	1	3	37	45	15	0	
B0587- 6	us	264	231	93	1.075	90	29	4	10	60	27	2	0	
B0588- 2	us	225	197	79	1.080	87	21	0	13	67	20	0	0	
B0687- 14	us	327	277	111	1.072	87	21	3	13	66	21	0	0	
Grand Mean		293	264	106	1.076	93	37	3	7	55	31	6	0	
CV		14	16		4	3	21							
Bayes LSD .05		67	62		.004	3	10	3	3	9	10	5	ns	

(1) All plots were 21' long and 3' wide with 4 reps. Seedpieces were spaced at 9". Commercial cultural practices were used which included irrigation. All plots were planted on 4/4 and harvested on 8/6.

(2) us = USDA Chapman Farm.

(3) Size 1 = Under 1 7/8, S2 = 1 7/8 TO 2 1/2, S3 = 2 1/2 to 3 1/4, S4 = 3 1/4 TO 4, and S5 = Over 4.

New Jersey Table 6. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for
24 Potato Varieties Grown in Bridgeton, NJ - 1991 (1).

Variety	P L A N T					&		TUBER CHARACTERS					T U B E R D E F E C T S										OVER	
	T S A		A P t		A M	C T S		D A U E		S G S			H G S			H N R			CC		ALL			
	y	z	p	p	t	l	x	h	p	p	n	y	G	C	S	H	G	S	H	N	R	CC	ALL	
Atlantic	6	6	6	6	7	7	6	2	8	7	7	8	9	7	3	9	9	9	8	38	5	6	7	
Superior	5	5	5	6	5	6	5	5	7	6	7	4	6	8	9	9	9	9	0	6	7	7	6	
B9792- 8B	6	8	8	8	9	7	6	3	5	6	5	8	5	9	3	8	9	9	1	3	8	5	7	
B9792-158	5	4	5	6	6	7	7	4	5	5	6	8	9	9	6	9	9	9	0	8	8	-	2	
B0174- 16	8	4	6	7	8	8	7	2	8	7	6	8	9	7	3	9	9	9	2	0	9	7	7	
B0175- 20	8	6	7	6	7	8	8	3	6	7	7	8	7	7	3	9	9	9	1	2	8	7	6	
B0178- 30	3	3	4	6	7	8	9	4	6	7	7	7	6	8	6	6	9	9	0	8	7	6	6	
B0209- 1	4	4	5	7	8	8	8	2	7	5	5	7	9	9	4	9	9	9	2	0	9	4	7	
B0241- 8	6	8	7	7	6	8	6	1	7	7	6	8	9	9	2	9	9	9	9	24	6	-	3	
B0257- 3	7	6	6	6	5	8	7	1	8	8	8	8	8	9	6	9	8	9	2	1	7	3	7	
B0257- 9	7	3	3	3	4	8	8	2	5	7	6	8	9	9	5	9	9	9	0	4	8	4	4	
B0257- 12	7	5	6	7	7	8	7	3	6	7	7	7	9	9	3	9	7	9	0	4	7	2	8	
B0564- 6	8	7	7	6	8	7	6	4	7	3	7	8	1	9	5	7	9	9	1	19	6	-	1	
B0564- 8	5	6	5	6	5	7	6	1	8	8	7	8	9	9	8	9	9	9	0	0	9	4	5	
B0564- 9	5	5	6	5	5	7	6	1	8	7	6	8	9	9	7	9	9	9	4	2	7	6	7	
B0583- 2	6	6	8	7	7	7	7	2	7	8	7	8	6	7	3	6	9	9	3	12	8	4	5	
B0583- 8	6	7	7	7	7	8	8	2	8	7	7	7	8	6	4	9	9	9	4	4	8	-	4	
B0585- 5	8	4	4	5	5	7	6	1	8	8	7	8	9	8	7	9	7	9	1	1	8	3	8	
B0587- 6	8	8	8	7	9	7	5	2	8	6	6	8	8	9	5	6	9	9	9	26	6	8	1	
B0588- 2	8	4	5	5	5	8	6	2	7	6	6	8	9	9	3	9	9	9	4	22	7	6	1	
B0687-14	6	4	5	6	6	9	8	3	7	5	5	6	6	9	5	9	9	9	0	0	9	6	6	

(1) See NJ Rating Table 17 for all plant and tuber characteristics, tubers defects and chip color.

New Jersey Table 7. Yields, Specific Gravities, and Tuber Sizes for 16 White & Red Potato Selections Grown on a Sandy Loam Soil at the Rutgers R & D Center - Bridgeton, NJ 1991 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield cwt/a	% of Sup.	Spec. Grav.	% O v e r				% Culls	% Tuber Sizes (3)				
						1	7/8	2	1/2		1	2	3	4	5
Atlantic	ne	315	287	130	1.082	92		34		1	8	57	29	5	0
Superior	ne	253	220	100	1.068	90		15		5	10	75	15	0	0
LA 12-59	nb	353	317	144	1.069	94		52		4	6	42	38	13	0
MN 12567	mn	287	243	110	1.065	88		15		3	12	73	15	0	0
MN 12966	mn	161	133	60	1.061	90		25		10	10	66	23	2	0
MN 13035	mn	260	194	88	1.057	81		3		6	19	78	3	0	0
ND 1871-3R	nd	225	175	79	1.058	85		25		9	15	60	23	3	0
Norchip	nd	192	160	72	1.076	82		11		0	18	71	11	0	0
Norland	nd	208	165	75	1.056	86		15		8	14	71	15	0	0
Red Pontiac	nd	340	232	105	1.054	88		24		20	12	64	22	2	0
MS 401-1	ms	208	172	78	1.080	82		8		0	18	73	8	0	0
MS 402-8	ms	66	52	23	1.074	80		19		8	20	61	15	4	0
W 856	wi	296	222	100	1.075	83		26		4	17	57	22	4	0
W 870	wi	252	231	105	1.088	90		27		0	10	63	24	3	0
W 877	wi	201	179	81	1.088	88		21		0	12	68	19	2	0
Belchip	ct	236	223	101	1.076	96		52		2	4	44	45	7	0
Grand Mean		241	200	90	1.070	87		23		5	13	64	20	3	0
CV		15	17		5	7		42							
Bayes LSD .05		49	44		.004	10		14		11	10	11	12	5	ns

(1) All plots were 21' long and 3' wide with 4 reps. Seedpieces were spaced at 9". Commercial cultural practices were used which included irrigation. All plots were planted on 4/4 and harvested on 8/6.
 (2) ct = Cert., mn = Minnesota, ms = Michigan, nb = Nebraska, ne = Sangerville Farm, nd = N. Dakota, wi = Wis.
 (3) Size 1 = Under 1 7/8, S2 = 1 7/8 TO 2 1/2, S3 = 2 1/2 to 3 1/4, S4 = 3 1/4 TO 4, and S5 = Over 4.

New Jersey Table 8. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for
16 Potato Varieties Grown in Bridgeton, NJ - 1991 (1).

Variety	P L A N T					&	TUBER CHARACTERS					T U B E R										D E F E C T S					OVER					
	T	S	A	A	M		C	T	S	D	A	U	E	S	G	S	H	G	S	H		S	R	B	H	N	R	CC	ALL			
	y	z	p	p	t		l	x	h	p	p	n	y	G	C	S	S	R	B	H		G	C	S	S	R	B	H	N	R	H	
Atlantic	6	5	5	6	7		7	6	2	7	7	7	8	9	7	5	9	9	6	1		39	5									7
Superior	5	6	6	5	4		7	6	3	6	5	7	5	7	7	9	8	9	9	2		7	7									6
LA 12-59	6	7	7	5	7		2	8	3	5	6	5	7	8	8	4	7	9	9	0		0	9									7
MN 12567	5	6	6	5	6		8	7	7	7	3	4	7	8	5	3	9	9	9	2		0	9									1
MN 12966	7	3	2	2	4		2	8	4	6	7	8	8	9	6	7	9	9	9	0		0	9									5
MN 13035	8	7	7	5	7		2	8	4	7	5	5	7	8	5	5	9	8	9	0		0	9									5
MN 1871-3R	7	7	6	5	8		2	8	3	7	4	4	7	4	7	5	7	9	9	1		2	8									6
Norchip	8	5	6	6	6		8	8	2	6	5	6	7	8	9	7	9	9	9	0		18	7									5
Norland	5	5	4	3	5		2	7	3	5	8	7	7	6	7	7	9	9	9	0		12	7									6
Red Pontiac	6	7	7	6	8		2	7	6	6	3	4	3	3	9	3	5	9	9	0		3	8									1
MS 401-1	8	5	6	4	4		8	7	2	6	7	8	7	8	8	8	9	8	9	1		3	7									3
MS 402-8	7	5	4	6	6		8	7	3	7	7	6	8	9	6	8	9	9	9	0		0	9									1
W 856	5	6	6	7	7		8	8	3	7	6	6	7	6	7	3	9	9	6	0		6	7									5
W 870	5	6	6	6	6		8	7	3	6	8	7	7	9	9	5	9	9	7	0		2	8									7
W 877	8	6	6	6	7		8	6	3	5	7	6	8	9	9	5	9	9	7	2		35	5									1
Belchip	6	6	7	7	7		8	8	3	2	5	5	6	9	9	2	9	9	9	0		10	7									7

(1) See NJ Rating Table 17 for all plant and tuber characteristics, tubers defects and chip color.

New Jersey Table 9. Yields, Specific Gravities, and Tuber Sizes for 16 White & Red Potato Selections Grown on a Sandy Loam Soil at the Rutgers R & D Center - Bridgeton, NJ 1991 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield cwt/a	% of Sup.	Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (3)				
						1	7/8	2 1/2		1	2	3	4	5
Atlantic	ne	372	352	118	1.078	96	40		1	4	56	35	5	0
Coastal Chip	pf	329	317	106	1.073	96	70		0	4	26	39	31	0
Norwis	pf	225	218	73	1.065	98	69		1	2	30	47	21	0
Oceania	pf	320	301	101	1.069	94	48		1	6	47	33	14	0
Snowden	pf	264	244	81	1.078	92	29		0	8	63	26	3	0
Reddale	ne	351	320	107	1.056	98	69		6	2	29	52	16	1
Superior	ne	321	298	100	1.065	95	27		3	5	68	25	2	0
AF1203-15	me	217	195	65	1.077	94	18		3	6	76	17	1	0
AF1377- 6	me	266	253	84	1.068	95	37		0	5	57	34	4	0
AF1424- 1	me	211	180	60	1.076	97	77		12	3	20	33	41	3
AF1425- 2	me	257	239	80	1.062	92	33		0	8	60	30	3	0
AF1437- 1	me	322	296	99	1.052	95	46		3	5	49	39	8	0
AF1443- 1	me	297	262	87	1.066	88	16		1	12	72	15	1	0
NY 79	ny	281	271	90	1.061	98	70		1	2	28	50	19	0
NY 87	ny	316	302	101	1.068	96	44		0	4	51	43	1	0
NY 88	ny	286	255	85	1.074	89	34		0	11	55	29	5	0
Grand Mean		290	269	90	1.068	95	45		2	5	49	34	11	0
CV		14	15		4	3	17							
Bayes LSD .05		58	59		.003	4	10		8	4	8	11	7	2

(1) All plots were 21' long and 3' wide with 4 replications. Seedpieces were spaced at 9". Commercial cultural practices were used throughout which included sprinkler irrigation. All plots were planted on April 4 and harvested on August 6.

(2) me = Maine, ne = Sangerville Seed Farm, ny = New York, pf = Porter Seed Farm.

(3) Size 1 = Under 1 7/8, S2 = 1 7/8 TO 2 1/2, S3 = 2 1/2 to 3 1/4, S4 = 3 1/4 TO 4, and S5 = Over 4.

New Jersey Table 10. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for
16 Potato Varieties Grown in Bridgeton, NJ - 1991 (1).

Variety	P L A N T					&	TUBER CHARACTERS					T U B E R										D E F E C T S				OVER					
	T S A		A M		C		T S D				A	U	E	S G S		H G S		H	N	R	C	C									
	y	z	p	p			t	l	x	h	p	p	n	y	G	C	S	S	R	B	H	N	R	C	C		ALL				
Atlantic	6	6	7	7	7	7	7	6	2	7	7	7	8			9	8	3			9	9	7	1	39	5			-		7
Coastal Chip	5	6	6	7	7	7	7	6	2	8	6	6	6			7	9	4			9	9	9	0	25	7			5		8
Norwis	4	7	6	5	7	7	8	8	2	5	6	6	7			9	9	3			9	9	9	0	24	7			6		6
Oceania	5	6	6	6	4	4	8	8	1	8	8	8	8			9	9	5			9	9	9	0	2	7			5		8
Snowden	8	7	7	7	7	7	7	6	2	8	7	7	6			9	9	3			9	9	9	1	8	8			3		6
Reddale	8	6	7	5	5	5	2	7	2	5	7	6	6			9	6	6			9	8	9	0	10	8			8		7
Superior	5	6	6	5	5	5	7	6	4	6	7	7	5			8	6	9			9	9	9	0	19	6			-		7
AF1203-15	8	3	3	5	4	4	8	6	1	8	8	7	6			9	7	8			9	9	9	0	29	6			-		1
AF1377- 6	4	5	5	5	7	7	8	6	3	7	6	6	8			8	9	4			8	7	9	0	39	6			-		1
AF1424- 1	8	7	6	7	9	9	8	8	2	7	1	1	8			6	9	3			9	9	9	0	30	5			-		1
AF1425- 2	3	4	6	4	5	5	8	8	2	7	7	7	8			9	9	6			9	9	9	0	3	8			-		6
AF1437- 1	6	7	7	6	7	7	7	6	2	7	6	5	7			6	9	4			9	7	9	0	0	9			-		6
AF1443- 1	6	5	6	5	5	5	7	7	1	8	7	7	8			9	7	9			9	9	9	0	7	8			-		6
NY 79	7	6	6	6	6	6	8	7	1	8	8	8	8			7	9	4			9	9	9	0	21	7			-		7
NY 87	7	7	7	7	7	7	8	8	4	7	7	7	6			9	8	5			9	9	9	4	4	8			-		7
NY 88	7	7	6	6	6	6	8	8	3	7	6	5	8			9	9	6			9	9	9	2	2	8			-		6

(1) See NJ Rating Table 17 for all plant and tuber characteristics, tubers defects and chip color.

New Jersey Table 11. Yields, Specific Gravities, and Tuber Sizes for 20 Russet Potato Selections Grown on a Sandy Loam Soil at the Rutgers Research & Dev. Center - Bridgeton, NJ 1991 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (3)				
			cwt/a	% of BelRus		4 oz	8 oz	1		2	3	4	5	
BelRus	ne	180	81	100	1.072	48	2		1	52	47	2	0	0
Coastal Russet	pf	253	152	187	1.059	84	49		25	16	35	37	9	3
Frontier Russet	ne	314	190	234	1.067	65	20		6	35	45	17	2	1
HiLite Russet	ne	327	189	233	1.065	64	25		8	36	39	17	6	2
Norking Russet	pf	336	238	293	1.066	78	40		8	22	38	29	8	2
Russet Burbank	ne	222	38	46	1.067	54	14		56	46	40	13	1	0
Russet Norkotah	ne	335	214	264	1.067	69	26		5	31	42	20	5	1
Shepody	pf	222	89	109	1.074	72	35		35	28	37	23	7	4
W1005	ne	319	178	219	1.067	65	15		13	35	50	11	3	1
B0190- 9	us	318	98	120	1.063	69	25		40	31	44	21	3	1
B0338- 2	us	155	67	82	1.062	54	8		12	46	46	8	0	0
B0338- 9	us	249	138	170	1.072	57	12		3	43	45	11	1	0
B0468-20	us	244	129	159	1.065	60	17		8	40	44	15	1	1
B0493- 8	us	351	255	314	1.070	77	32		5	23	45	23	6	3
B0502-22	us	259	104	128	1.066	49	4		10	51	46	4	0	0
B0655- 3	us	206	105	129	1.068	58	15		9	42	43	12	3	0
B0671-22	us	300	152	187	1.076	55	14		7	45	41	11	2	0
BelRus	us	177	81	100	1.072	51	13		7	49	38	11	2	0
Norgold Russet	nd	274	147	181	1.062	64	21		12	36	43	17	3	1
ND 1538-1 Rus	nd	303	192	237	1.061	77	34		14	23	42	28	5	1
Grand Mean		267	142	175	1.067	64	21		14	36	43	17	3	1
CV		13	29		4.	14	36							
Bayes LSD .05		46	55		.003	12	10		13	12	ns	7	6	ns

(1) All plots were 21' long and 3' wide with 4 reps. Seedpieces were spaced at 9". Commercial cultural practices were used which included irrigation. All plots were planted on 4/4 and harvested on 8/6.

(2) ne = Sangerville Farm, nd = North Dakota, pf = Porter Seed Farm, us = USDA Chapman Farm.

(3) Size 1 = Under 4 oz, S2 = 4 to 8 oz, S3 = 8 to 12 oz, S4 = 12 to 16 oz, and S5 = Over 16 oz.

New Jersey Table 12. Plant and Tuber Characters, Tuber Defects, and Overall Rating for
20 Russet Potato Varieties Grown in Bridgeton, NJ - 1991 (1).

Variety	P L A N T					&	TUBER CHARACTERS					T U B E R D E F E C T S										OVER ALL		
	T	S	A	A	M		C	T	S	D	A	U	E	S	G	S	H	G	S	H	H		N	R
	y	z	p	p	t		l	x	h	p	p	n	y	G	C	S	S	R	B	H	N		R	
BelRus	3	4	5	2	5	5	1	8	5	7	7	8	9	9	6	9	9	9	0	5	7	7		
Coastal Russet	7	6	6	5	6	6	5	8	6	6	5	8	6	6	4	7	8	9	1	11	7	6		
Frontier Russet	8	7	7	6	7	5	4	8	7	7	7	8	8	8	3	9	9	9	0	0	9	8		
HiLite Russet	9	6	7	5	7	6	5	8	7	6	5	8	7	9	5	7	9	9	0	10	8	6		
Norking Russet	9	8	7	7	7	5	3	8	5	8	7	8	6	7	5	9	9	9	3	9	7	5		
Russet Burbank	6	8	8	8	8	6	5	9	8	2	2	6	1	7	6	6	9	9	0	5	8	1		
Russet Norkotah	6	7	7	6	7	5	3	8	7	6	6	8	8	9	7	9	9	9	0	0	9	8		
Shepody	5	7	7	7	6	8	8	7	6	3	3	7	5	9	7	5	9	9	2	2	7	1		
W1005	9	7	7	8	9	5	3	9	6	7	5	8	6	8	6	8	9	9	1	0	9	6		
B0190- 9	7	7	7	7	8	5	4	7	6	4	2	7	4	7	7	6	9	9	0	1	7	3		
B0338- 2	3	4	5	2	2	5	4	8	6	6	6	8	8	6	9	9	9	9	1	0	9	3		
B0338- 9	6	5	5	6	6	6	5	7	7	5	5	7	8	9	7	9	7	9	2	5	8	2		
B0468-20	4	6	5	4	4	8	7	7	7	6	5	8	6	9	5	9	9	9	0	0	9	4		
B0493- 8	6	8	7	6	8	7	6	8	7	6	5	8	7	9	7	7	7	9	0	0	9	6		
B0502-22	6	8	8	6	8	4	2	6	5	5	4	8	6	7	7	9	9	9	9	2	8	1		
B0655- 3	4	4	5	3	3	8	8	8	4	3	3	5	6	6	4	9	7	9	5	1	8	1		
B0671-22	6	4	6	6	6	6	5	8	7	6	5	8	8	7	6	6	9	9	9	18	7	2		
BelRus	4	3	4	2	6	5	3	8	5	6	5	7	8	9	7	9	9	9	1	11	7	5		
Norgold Russet	6	5	6	5	8	5	3	8	6	8	5	7	5	8	7	7	9	9	1	2	7	5		
ND 1538-1rus	5	7	6	6	7	5	3	8	5	7	7	7	7	7	7	6	9	9	0	0	9	8		

(1) See NJ Rating Table 17 for all plant and tuber characteristics, tubers defects and chip color.

New Jersey Table 13. Yields, Specific Gravities, and Tuber Sizes for 17 White & Red Selections Grown on a Sandy Loam Soil at the Snyder Res. and Ext. Farm - Pittstown, NJ 1991 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (3)				
			cwt/a	% of Sup.		1	7/8	2 1/2		1	2	3	4	5
Allegany	ne	462	434	92	1.074	97	73	3	3	24	35	35	3	
Atlantic	ne	429	397	84	1.080	95	68	3	5	27	35	31	2	
Chaleur	ne	278	262	55	1.065	96	74	2	4	22	52	22	0	
Cherry Red	pf	361	322	68	1.069	94	66	5	6	28	42	25	0	
Norland	ne	355	301	64	1.054	93	45	8	7	47	31	14	0	
Dark Red N	pf	362	320	68	1.053	95	59	6	5	36	43	15	1	
Oceania	pf	432	404	85	1.065	96	66	2	4	30	39	27	0	
Reddale	ne	515	441	93	1.054	97	81	11	3	16	29	43	8	
B0616- 1	cf	368	328	69	1.057	92	60	3	8	33	37	22	0	
Saginaw Gold	ne	585	491	104	1.072	94	57	10	6	37	39	19	0	
Somerset	ne	520	449	95	1.081	94	52	8	6	42	41	11	0	
Steuben	ne	580	506	107	1.069	97	75	10	3	22	32	39	4	
ND2224-5red	nd	418	318	67	1.052	83	39	6	17	43	25	14	0	
Superior	ne	513	470	100	1.068	96	70	4	4	26	38	30	2	
Yukon Gold	ne	414	375	79	1.071	95	68	5	5	28	38	30	0	
F82026	ne	537	410	87	1.074	92	51	16	8	40	38	13	0	
LA 12-59	pf	511	478	101	1.068	98	80	4	2	17	38	42	0	
Grand Mean		449	395	84	1.066	94	64	6	6	31	37	25	1	
CV		16	17		7.	4	9							
Bayes LSD .05		102	97		.006	5	7	5	5	7	8	9	3	

(1) All plots were 21' long and 3' wide with 4 replications. Seedpieces were spaced at 9". Commercial cultural practices were used throughout which included sprinkler irrigation. All plots were planted on April 11 and harvested on September 24.

(2) me = Maine, ne = Sangerville Seed Farm, ny = New York, pf = Porter Seed Farm.

(3) Size 1 = Under 1 7/8, S2 = 1 7/8 TO 2 1/2, S3 = 2 1/2 to 3 1/4, S4 = 3 1/4 TO 4, and S5 = Over 4.

New Jersey Table 14. Plant and Tuber Characters, Tuber Defects, and Overall Rating for
10 Potato Varieties Grown in Pittstown, NJ - 1991 (1).

Variety	P L A N T					&		TUBER CHARACTERS					T U B E R D E F E C T S										OVER ALL		
	T	S	A	A	M	C	T	S	D	A	U	E	S	G	S	H	G	S	R	B	H	N		R	
	y	z	p	p	t																				
Allegany	8	9	8	6	8	7	6	2	7	7	6	-	-	-	-	-	-	-	-	-	-	1	0	9	6
Atlantic	6	7	8	7	6	7	7	2	7	7	7	-	-	-	-	-	-	-	-	-	-	7	25	5	7
Chaleur	2	4	4	5	6	8	9	5	6	5	5	-	-	-	-	-	-	-	-	-	0	3	8	5	
Cherry Red	8	6	5	7	7	2	8	2	8	6	6	-	-	-	-	-	-	-	-	-	9	10	7	7	
Norland	5	5	4	3	3	2	8	5	6	7	6	-	-	-	-	-	-	-	-	-	2	0	9	6	
Dark Red Norl.	5	6	5	4	4	2	8	4	6	6	6	8	7	7	9	9	7	9	9	7	0	1	8	6	
Oceania	5	7	7	7	5	8	8	2	8	7	7	8	9	7	9	9	7	9	9	7	1	1	5	7	
Reddale	9	7	8	7	5	2	8	3	4	6	5	7	9	5	9	9	7	9	9	7	7	1	8	4	
B0616- 1	4	7	6	6	7	2	6	3	6	6	7	8	7	9	8	9	7	9	9	0	25	7	3	3	
Saginaw Gold	3	6	7	7	6	8	8	3	6	4	5	8	6	9	9	9	9	5	9	0	11	6	5	5	
Somerset	9	7	8	8	6	8	8	5	7	7	7	8	8	9	8	9	9	6	9	0	1	8	8	8	
Steuben	9	8	9	8	7	7	7	2	8	8	7	8	8	5	9	9	7	9	9	2	1	7	6	6	
ND2224-5red	5	6	6	3	5	2	8	4	7	8	7	8	9	8	9	9	8	9	9	0	0	9	6	6	
Superior	5	7	8	7	5	7	7	2	6	7	6	5	7	9	9	9	9	9	9	0	0	9	8	8	
Yukon Gold	7	9	8	7	5	8	8	2	5	6	6	7	9	9	9	9	9	9	9	4	1	7	7	7	
F82026	5	8	7	9	9	8	8	3	5	4	5	5	8	4	9	7	5	9	9	0	0	9	2	2	
LA12-59	6	9	8	7	8	2	8	5	7	7	7	7	9	6	6	9	7	9	9	1	0	9	8	8	
B0256- 1	8	8	8	7	7	8	6	3	6	8	7	8	7	7	9	9	9	9	9	0	0	9	7	7	
B0257- 3	8	6	8	8	5	8	7	2	7	7	7	8	9	9	8	9	8	9	9	3	0	9	8	8	
B0257- 9	8	4	6	5	6	8	8	2	7	7	7	8	9	7	9	9	9	9	9	1	0	9	6	6	
B0257- 12	9	6	8	6	5	8	8	2	6	8	7	8	9	5	9	9	9	9	9	0	0	9	7	7	
B0903- 2	8	7	7	5	7	1	8	5	6	7	6	8	7	9	9	8	7	9	9	0	0	9	6	6	
MN 13035	6	8	8	7	8	2	8	2	5	6	5	6	8	6	9	9	6	9	9	0	1	7	3	3	
NY 79	9	6	7	8	6	8	7	1	8	8	8	5	9	9	9	9	8	9	9	0	1	8	8	8	
NY 87	9	8	8	8	7	8	7	3	7	7	7	6	9	9	9	9	8	9	9	3	0	9	7	7	
NY 88	5	7	7	8	7	7	8	2	6	7	7	7	8	9	9	9	8	9	9	0	0	9	6	6	

(1) See NJ Rating Table 17 for all plant and tuber characteristics, tubers defects and chip color.

New Jersey Table 15. Yields, Specific Gravities, and Tuber Sizes for 10 Russet Potato Varieties Grown on a Silt Loam Soil at the Snyder Research & Extension Farm - Pittstown, NJ 1991 (1).

Variety Name	Seed Source (2)	Total Market Yield		Spec. Grav.	% O v e r		% Culls	% Tuber Sizes (3)		
		Yield cwt/a	% of BelRus		4 oz	8 oz		1	2	3 4 5
BelRus	ne	317	220	100	1.071	72	27	3	28	45 21 7 0
Coastal Russet	pf	418	313	142	1.065	85	55	10	15	29 28 18 10
Frontier Russet	ne	393	264	120	1.067	76	47	9	24	28 23 13 11
Hilite Russet	ne	356	263	119	1.064	76	45	2	24	31 25 16 4
Norking Russet	pf	373	296	134	1.069	91	68	11	9	23 28 23 17
Russet Burbank	ne	510	175	79	1.071	69	31	35	31	38 17 9 6
Russet Norkotah	ne	450	329	149	1.063	79	41	6	21	38 24 10 7
Shepody	pf	403	183	83	1.070	86	61	40	14	24 26 15 20
W1005	ne	509	377	171	1.074	81	40	7	19	41 24 12 3
ND1538-1rus	nd	448	287	130	1.071	74	35	11	26	40 18 11 5
Grand Mean		418	271		1.069	79	45	13	21	34 23 13 8
CV		11	14		8.	5	15	34		
Bayes LSD .05		64	53		ns	6	9	6	6	9 0 7 7

(1) All plots were 21' long and 3' wide with 4 replications. Seedpieces were spaced at 12". Commercial cultural practices were used throughout which included irrigation. All plots were planted on April 11 and harvested on September 24.

(2) ne = Sangerville Farm, nd = North Dakota, pf = Porter Seed Farm.

(3) Size 1 = Under 4 oz, S2 = 4 to 8 oz, S3 = 8 to 12 oz, S4 = 12 to 16 oz, and S5 = Over 16 oz.

New Jersey Table 16. Plant and Tuber Characters, Tuber Defects, and Overall Rating for
10 Russet Potato Varieties Grown in Pittstown, NJ - 1991 (1).

Variety	P L A N T				&				TUBER CHARACTERS				T U B E R				D E F E C T S				OVER	
	T S A	A A	A M	P t	C T S	D	A U E	S G S	H G S	S R B	H N R	ALL	S G S	H G S	S R B	H N R	H	H	N R	ALL		
	y z p	p p	p t	p t	1 x h	p p	p n y	C C S	S R B	S R B	H N R	ALL	C C S	S R B	S R B	H N R	H	H	N R	ALL		
BelRus	5	6	7	7	4	2	8	6	8	7	8		9	9	9	9	2	12	6		6	
Coastal Russet	5	7	6	7	6	6	4	8	7	7	6	8	6	7	9	9	9	0	11	6		5
Frontier Russet	5	7	7	8	7	7	8	7	6	5	5	8	8	9	9	9	7	9	2	0	9	6
HiLite Russet	8	5	7	7	7	7	5	8	6	6	6	7	8	9	8	9	9	4	1	6		8
Norking Russet	6	7	7	8	7	5	3	8	6	6	6		8	7	9	9	9	5	28	5		2
Russet Burbank	9	9	9	8	9	5	4	9	7	2	1	7	1	5	9	9	7	9	6	2	7	1
Russet Norkotah	5	7	7	8	6	5	3	8	7	7	7	5	7	9	9	9	9	6	2	8		7
Shepody	5	7	7	8	6	8	8	8	6	3	1	8	4	7	9	7	7	9	5	4	8	2
W 1005	9	9	9	9	8	5	4	9	7	6	6	8	8	9	9	8	9	9	6	0	9	7
ND1538-1rus	9	6	8	8	5	4	3	8	6	6	5	7	9	9	9	9	9	0	0	9		7

(1) See NJ Rating Table 17 for all plant and tuber characteristics, tubers defects and chip color.

New Jersey Rating Table 17. Codes and ratings for plant and tuber characteristics, tuber defects and chip color.

Plant Characters		Tuber Characters		Tubers Defects		Defect Rating		Ty = Plant Type	
Ty = Type		Cl = Color		SG = Second Growth		1 = Dead		1 = V. decumbent	
Sz = Size		Tx = Texture		GC = Growth Crack		2 = Very Severe		2 =	
Ap = Appearance		Sh = Shape		SS = Skin Set		3 = Severe		3 = decumbent	
AP = Air Pollution		Dp = Depth		HS = Heat Sprouts		4 =		4 =	
Mt = Vine Maturity		Ap = Appearance		GR = Green Tubers		5 = Moderate		5 = Spreading	
		Un = Uniformity		SB = Scab		6 =		6 =	
		Ey = Eye Depth		HH = No. of Hollow Heart		7 = Slight		7 = Upright	
				HN = No. of Heat Necrosis		8 = Very Slight		8 =	
				R = Heat Nec. Rating		9 = No Symptoms		9 = Very Upright	

Plant / Tuber		Plant / Tuber		Plant / Tuber		Plant / Tuber		Plant / Tuber	
Sz=Plant Size	AP=Appearance	AP=Air Pollution	Mt=Vine Maturity	Cl=Tuber Color	Tx=Tuber Tex.	Sz=Plant Size	AP=Appearance	AP=Air Pollution	Mt=Vine Maturity
1 = V. Small	1 = Very poor	1 = Dead	1 = Very Early	1 = Purple	1 = Part Rus	1 = V. Small	1 = Very poor	1 = Dead	1 = Very Early
2 =	2 =	2 =	2 = Early	2 = Red	2 = Heavy Rus	2 =	2 =	2 = Very Severe	2 = Early
3 = Small	3 = Poor	3 = Mod. Defol	3 =	3 = Pink	3 = Mod. Rus	3 = Small	3 = Poor	3 = Severe	3 =
4 =	4 =	4 =	4 = Med Early	4 = Dark Brown	4 = Light Rus	4 =	4 =	4 =	4 = Med Early
5 = Medium	5 = Fair	5 = Mod Injury	5 = Medium	5 = Brown	5 = Net	5 = Medium	5 = Fair	5 = Spreading	5 = Medium
6 =	6 =	6 =	6 = Med Late	6 = Tan	6 = Sl. Net	6 =	6 =	6 =	6 = Med Late
7 = Large	7 = Good	7 = Mild Injury	7 =	7 = Buff	7 = Mod. Smooth	7 = Large	7 = Good	7 = Upright	7 =
8 =	8 =	8 =	8 = Late	8 = White	8 = Smooth	8 =	8 =	8 =	8 = Late
9 = V. Large	9 = Excellent	9 = No Symptoms	9 = Very Late	9 = Bright White	9 = Very Smooth	9 = V. Large	9 = Excellent	9 = Very Upright	9 = Very Late

Sh=Tuber Shape		Dp=Tuber Depth		Un=Tuber Uniformity		Ey=Eye Depth		CC=Chip Color		Overall	
1 = V. Round		1 = V. Flat		1 = V. Variable		1 = V. Deep		1 = Paper white		1 = Discards	
2 = Round		2 =		2 =		2 =		2 =		2 =	
3 = Round-oblong		3 = Flat		3 = Variable		3 = Deep		3 =		3 =	
4 = Mostly Oblong		4 =		4 = Unacceptable		4 =		4 = Acceptable		4 =	
5 = Oblong		5 = Acceptable		5 =		5 = Medium		5 = Borderline		5 = Some Merit	
6 = Mostly Oblong		6 =		6 = Acceptable		6 =		6 = Unacceptable		6 = Try Again	
7 = Mostly Long		7 = Good		7 =		7 = Shallow		7 =		7 = Good	
8 = Long		8 =		8 =		8 =		8 =		8 = Excellent	
9 = Cylindrical		9 = V. Round		9 = V. Uniform		9 = V. Shal.		9 = Black chip		9 = Name It	

IDAHO

S. Love, A. Thompson-Johns, J. Pavsek, D. Corsini

Replicated Variety Trials

Potato Variety Trials were conducted in five separate potato growing areas in southern Idaho, including Aberdeen, Kimberly, Parma, Rexburg and Shelley. The trial locations included both experiment station and commercial production sites representing a wide range of soil types and environments. Rexburg and Shelley are commercial production sites with short growing seasons (110 and 120 days, respectively). Aberdeen, Kimberly and Parma are experiment station sites with longer growing seasons (130, 140 and 150 days, respectively).

The trials were planted between April 10 and May 30 and harvested between September 5 and October 4. Management practices were common to the respective growing areas and largely conformed to University of Idaho recommendations. Results of the variety trials are summarized in Tables 1-6.

The majority of trials were dedicated to evaluating russet and long-white selections with both fresh market and processing potential. The exceptions were the Rexburg Variety Trial and the Aberdeen Regional Chipping Trial which both included clones evaluated for chipping potential. All locations had good growing conditions and good average yields.

Of the russet and long-white clones evaluated, only HiLite Russet had inadequate yields (Tables 5 and 6). Several clones had excellent yield and quality characteristics at all locations. These included A81473-2, A82119-3, and A84118-3. A8495-1 is an early russet clone that appeared to have excellent processing potential (Tables 3, 5 and 6).

Most of the chipping clones evaluated had excellent yield and quality (Tables 6 and 7). The exceptions were Calchip, with low yield, and C084111-6 with both low yield and darker chip color. NDA2031-2 was the highest yielding clone and again had excellent color when chipped directly from 40°F storage. ND01496-1 also appears to have some cold chipping potential, although not from 40°F.

Metribuzin screening

Twelve varieties and twenty-six breeding selections were screened for metribuzin sensitivity. Plots treated with metribuzin (1.0 lb a.i./A, post-emergent) were compared with hand-weeded checks for phytotoxicity and vigor (plant height). Percent yield loss in the treated plots was predicted using a model developed from several years of similar data.

Shepody is used as a highly sensitive standard and had a yield loss of 60%. One chipping clone from Colorado, AC83306-1, was as sensitive as Shepody. Several other clones had sufficient sensitivity to be of concern. These include the chipping clones Atlantic, Norchip, and NDA2031-2 and the russet clones A7961-1, A81473-2, A82119-3, A080432-1, A082283-1, and A08478-1. The chipping clones have traditionally been more sensitive to metribuzin than russet clones, due largely to susceptible parents and common genetic backgrounds within each market class. However, the majority of the chipping type selections evaluated in 1991 were highly tolerant of metribuzin.

IDAHO TABLE 1. 1991 ADVANCED POTATO VARIETY TRIAL - ABERDEEN, IDAHO.

Clone	Total Yield	U.S. No. 1's			<4 oz	Culls & U.S.No. 2		Specific Gravity	HH ¹	BS ²	Fry ² Color
		Yield	%	>12 oz		6 to 12 oz	%				
	---cwt/acre---						----- % -----		----- % -----		
A81386-1	358	326	91	36	6	44		1.083	5	3.2	1.0
A81473-2	392	349	89	40	6	38		1.086	18	1.9	1.4
A82119-3	304	268	88	36	6	44		1.086	35	3.0	1.2
A84118-3	334	301	90	22	9	48		1.091	27	2.0	1.0
A84279-5	375	326	87	46	5	32		1.090	68	2.2	1.7
A84281-5	328	262	80	29	10	36		1.074	31	2.4	1.1
A84342-15	332	266	80	23	12	42		1.085	28	2.6	1.2
A84372-4	328	249	76	24	8	40		1.089	55	3.7	1.1
A84422-3	329	257	78	14	16	44		1.089	77	2.4	0.6
A85103-3	392	333	85	30	11	40		1.088	51	2.9	1.5
A85355-2	361	285	79	25	10	41		1.091	22	2.4	1.2
Lemhi Russet	400	340	85	20	10	49		1.089	30	4.3	1.2
Ranger Russet	343	298	87	25	8	48		1.092	0	3.6	1.2
Russet Burbank	339	244	72	14	14	41		1.078	0	2.0	1.4
Mean	351	291	83	28	9	42		1.086	32	2.8	1.2
LSD (.05)	49							0.004		0.7	0.3

¹ Hollow heart was measured by cutting tubers >12 oz.

² Blackspot bruise rating with 1=resistant, 5=susceptible.

³ USDA fry grade with lower score indicating lighter color; potatoes stored at 45°F.

IDAHO TABLE 2.

1991 ADVANCED POTATO VARIETY TRIAL - KIMBERLY, IDAHO.

Clone	Total Yield	U.S. No. 1's				<4 oz	Culls & U.S.No. 2	Specific Gravity	HH ¹	BS ²	Fry ² Color
		Yield	%	>12 oz	6 to 12 oz						
	---	cwt/acre---			%				---		
A81386-1	450	405	90	20	58	7	3	1.086	3	3.1	1.1
A81473-2	541	498	92	34	46	4	4	1.087	30	2.4	1.6
A82119-3	464	440	95	41	46	4	2	1.090	43	2.8	1.3
A84118-3	456	401	88	32	46	6	5	1.094	43	1.8	1.2
A84279-5	506	455	90	34	49	5	4	1.095	65	2.4	1.9
A84281-5	430	383	89	22	55	10	1	1.082	28	2.3	0.9
A84342-15	522	444	85	35	42	6	9	1.087	28	2.9	1.6
A84372-4	540	421	78	47	28	6	16	1.092	45	2.9	1.2
A84422-3	442	349	79	10	44	18	4	1.098	61	2.2	0.6
A85103-3	555	511	92	35	46	6	1	1.095	70	2.9	1.6
A85355-2	529	481	91	35	46	5	4	1.094	35	2.6	1.1
Lemhi Russet	524	424	81	40	34	8	12	1.089	68	4.2	1.3
Ranger Ranger	393	350	89	36	44	4	8	1.098	0	3.4	1.5
Russet Burbank	492	369	75	16	42	12	13	1.080	0	2.6	1.8
Mean	489	425	87	31	45	7	6	1.091	36	2.8	1.3
LSD (0.05)	56							0.003		0.5	0.4

¹ Hollow heart was measured by cutting tubers >12 oz.² Blackspot bruise rating with 1=resistant, 5=susceptible.³ USDA fry grade with lower score indicating lighter color; potatoes stored at 45°F.

IDAHO TABLE 3.

1991 TRI-STATE POTATO VARIETY TRIAL - ABERDEEN, IDAHO

Clone	Total Yield	U.S. No. 1's				Culls &		Specific Gravity	Hollow ¹ Heart	BB ²	SB ³	Fry ⁴ Color
		Yield	% >12 oz	6 to 12 oz	<4 oz	U.S.No. 2						
							----- % -----					
	---cwt/acre---								---%---			
Russet Burbank	442	252	57	5	30	26	17	1.084	13	2.7	3.6	1.2
Lemhi Russet	497	411	83	11	49	14	3	1.091	15	4.6	3.8	1.1
A8495-1	406	327	81	16	45	16	4	1.088	0	3.0	3.5	1.1
A8174-2	356	249	70	11	40	22	8	1.076	0	3.0	3.7	1.5
A082281-1	399	348	87	25	46	11	2	1.080	25	4.0	2.9	1.3
ND02904-7	346	264	76	19	36	19	5	1.070	0	1.5	3.7	1.8
A077224-3	317	249	79	6	47	20	1	1.083	20	3.5	3.2	1.8
A080432-1	328	247	75	7	43	23	2	1.089	9	3.5	3.4	1.1
A81286-1	480	413	86	25	44	12	2	1.087	0	2.7	3.1	1.3
A81478-1	406	374	92	31	49	7	0	1.092	0	2.8	3.9	1.6
A82622-52	378	299	79	17	44	16	5	1.105	13	2.4	3.6	1.3
A08341-10	433	362	84	10	51	14	3	1.083	0	2.9	3.5	2.7
A8390-3	349	279	80	15	40	19	1	1.082	23	2.7	3.9	1.4
A08478-1	276	227	82	39	31	11	7	1.083	18	3.7	3.6	1.7
A084275-3	406	305	75	14	41	22	2	1.098	0	3.2	3.8	1.0
A081775-3	278	220	79	6	45	21	0	1.085	0	3.2	3.8	1.8
Mean	381	302	79	16	43	17	4	1.086	9	3.1	3.6	1.5
LSD(0.05)	50	54						0.003		0.4	0.3	0.4

¹ Hollow heart was measured by cutting tubers >12 oz.² Blackspot bruise rating, with 1=resistant, 5=susceptible.³ Shatter bruise rating, with 1=resistant, 5=susceptible.⁴ USDA fry grade with lower score indicating lighter color; potatoes stored at 45°F.

IDAHO TABLE 4. 1991 POTATO VARIETY TRIAL - PARMA, IDAHO.

Clone	Total Yield	U.S. No. 1's		<4 oz	Culls & U.S.No. 2	Specific Gravity	Fry ² Color	Sugar Ends
		Yield	%					
	---cwt/acre---		----- % -----					--- % ---
Russet Burbank	445	246	55	28	5	1.076	2.8	47
Lemhi Russet	408	313	77	41	5	1.088	2.5	8
Shepody	419	367	88	47	3	1.087	3.4	18
Norking Russet	335	276	82	47	2	1.086	2.7	10
Ranger Russet	469	387	83	52	3	1.091	2.2	58
Frontier Russet	327	240	73	36	4	1.085	2.7	28
A7961-1	360	306	85	53	1	1.081	3.1	62
A81473-2	389	336	86	45	6	1.090	1.9	25
A82119-3	469	431	92	55	1	1.086	2.3	38
A082611-7	354	213	60	23	1	1.085	2.3	27
A082283-1	378	300	79	49	3	1.083	1.0	14
A8174-2	344	276	80	47	1	1.076	2.8	3
Mean	391	308	78	44	3	1.085	2.5	28
LSD(0.05)	71	69				0.004	0.5	

¹ Hollow heart was determined by cutting tubers >12 oz.

² USDA fry grade with lower score indicating lighter color; potatoes stored at 45°F.

³ Percentage of tubers producing fries with ends rated 3+ and at least one full point darker than the remainder of the fry.

Clone	Total Yield	U.S. No. 1's		<4 oz	Culls & U.S.No. 2		Specific Gravity	HH ¹	BB ²	SB ³	Fry ⁴ Color
		Yield	%		6 to 12 oz	%					
	---	cwt/acre---	---	---	---	---	---	---	---	---	---
Russet Burbank	338	214	63	8	33	20	17	1.079	3	3.1	3.6
Lemhi Russet	338	276	82	29	40	12	7	1.087	12	4.6	3.7
Frontier Russet	268	208	78	9	51	15	7	1.083	2	2.5	3.0
Ranger Russet	346	276	80	28	40	7	13	1.089	0	3.7	3.5
NorKing Russet	307	242	79	10	48	15	7	1.081	23	3.6	3.9
Shepody	301	221	73	20	40	14	13	1.082	2	2.5	3.5
HiLite Russet	211	137	65	3	32	33	2	1.077	3	3.0	3.7
A7961-1	303	240	79	19	46	12	9	1.086	22	3.5	2.0
A81473-2	398	364	91	46	36	6	3	1.083	3	3.0	4.2
A82119-3	335	267	80	33	36	10	10	1.081	0	3.1	4.0
Century Russet	434	379	87	32	42	8	5	1.084	0	2.8	3.9
A8174-2	283	206	73	8	45	22	6	1.073	8	3.0	3.6
A082611-7	266	183	69	9	36	21	10	1.090	0	3.1	3.4
A8495-1	277	231	83	18	44	14	3	1.089	0	2.9	3.6
Mean	315	246	77	19	41	15	8	1.083	6	3.2	3.5
LSD(0.05)	39	35						0.002		0.4	0.2

- ¹ Hollow heart was determined by cutting tubers >12 oz.
- ² Blackspot bruise rating, with 1=resistant, 5=susceptible.
- ³ Shatter bruise rating, with 1=resistant, 5=susceptible.
- ⁴ USDA fry grade with lower score indicating lighter color; potatoes stored at 45°F.

IDAHO TABLE 6. 1991 POTATO VARIETY TRIAL - REXBURG, IDAHO

Clone	Total Yield	U.S. No. 1's		Culls & U.S.No. 2	Specific Gravity	HH ¹	BB ²	SB ³	Fry ⁴ Color	
		Yield	%							
		----- % -----								
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¹ Hollow heart was determined by cutting tubers >12 oz.

² Blackspot bruise rating, with 1=resistant, 5=susceptible.

³ Shatter bruise rating, with 1=resistant, 5=susceptible.

⁴ USDA fry grade with lower score indicating lighter color; potatoes stored at 45°F.

IDAHO TABLE 7.

1991 REGIONAL CHIPPING POTATO VARIETY TRIAL - ABERDEEN, IDAHO

Clone	Total Yield	U.S. No. 1's				Culls & Specific		HH ¹	BB ²	SB ³	Chip ⁴ Color	
		Yield	%	6 to 12 oz		<4 oz	U.S.No. 2 Gravity					
				---	---							---
	---cwt/acre---							-%-				
ATLANTIC	364	299	82	9	44	17	1	1.091	0	1.1	3.1	1.1
GEMCHIP	438	387	88	18	52	11	0	1.082	6	2.3	3.2	1.9
NORCHIP	356	226	63	5	25	35	2	1.078	5	1.4	2.9	2.0
AC83306-1	457	380	83	7	53	16	1	1.089	0	1.9	2.5	1.0
NDA2031-2	494	394	80	14	43	20	0	1.084	0	1.1	3.2	1.1
NDO1496-1	360	221	61	3	34	35	4	1.091	0	1.5	3.7	1.0
SNOWDEN	392	271	69	3	32	30	1	1.091	0	2.2	2.8	1.1
CO84111-6	290	189	65	7	33	34	1	1.083	15	2.5	4.1	2.0
CALCHIP	326	193	59	2	29	40	1	1.110	0	2.1	3.2	1.5
Mean	386	284	72	8	38	26	1	1.089	3	1.8	3.2	1.4
LSD(0.05)	60	65						0.004		0.4	0.3	0.6

¹ Hollow heart was measured by cutting tubers >12 oz.² Blackspot bruise rating, with 1=resistant, 5=susceptible.³ Shatter bruise rating, with 1=resistant, 5=susceptible.⁴ Chip Color: 0-5 chip score with 0=light, 5=dark; from tubers stored at 50°F.

Entry	Plant Damage	Predicted ²
	21 Days Following Application	Yield Reduction Due to Application
-----%		
<u>Russets and Long Whites</u>		
Russet Burbank	13	0
Century Russet	0	0
Frontier Russet	25	7
HiLite Russet	20	7
Lemhi Russet	20	6
Shepody	79	60
A7961-1	50	28
A8174-2	10	0
A81286-1	20	9
A81473-2	40	18
A81478-1	10	0
A82119-3	35	16
A8390-3	18	3
A8495-1	20	4
AC7869-17	20	6
A080432-1	40	21
A081775-3	20	8
A082283-1	50	33
A082611-7	10	0
A083037-10	18	2
A08478-1	40	22
A084275-3	15	1
ATX6-84378-1Russ	13	0
C082142-4	20	7
C0083008-1	8	0
ND671-4Russ	15	0
ND1538-1Russ	20	5
ND02904-7	8	0
<u>Chippers</u>		
Norchip	28	11
Atlantic	70	43
Calchip	8	0
Chipeta	3	0
Gemchip	20	5
Snowden	3	0
A80559-2	5	0
AC83306-1	83	60
NDA2031-2	50	29
ND01496-1	15	2

¹ Metribuzin applied postemergence (8 inch plants) at a rate of 1.0 lb a.i./A (17.5 gpa, 30 psi).

² Yield reduction is expressed as a percentage of untreated control plots and was calculated using the model: $[1 - (1.142 + 0.176 (\text{Log}(\text{plant height treated} / \text{plant height control})) - 0.00796 (\text{plant damage}))] \times 100$.

